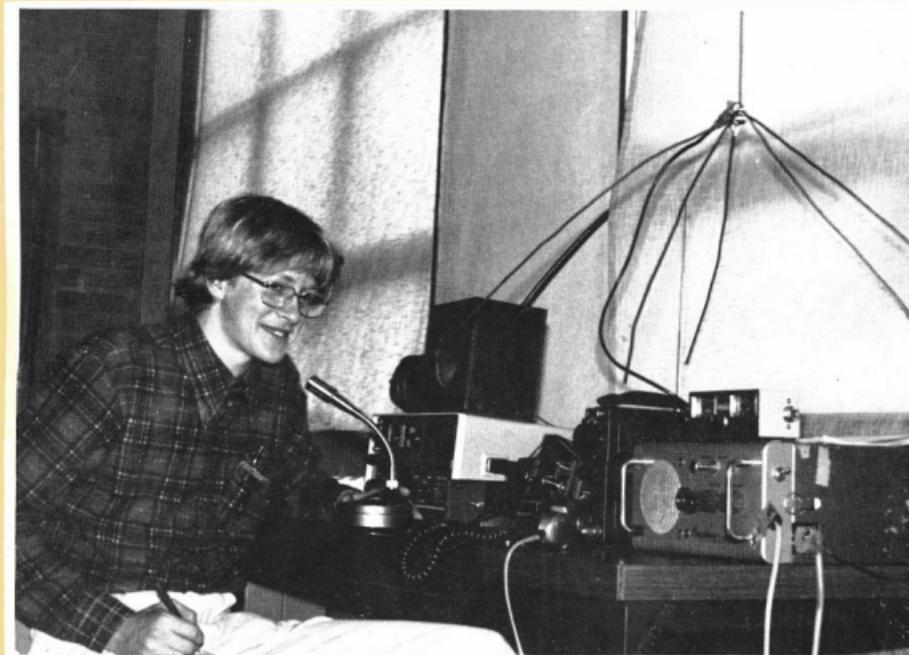


# amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA



VOL. 46, No. 12

DECEMBER 1978

## SPECIAL NOVICE ISSUE

### COVER PHOTO

Michael Goard VK2ZNV operating portable at the amateur radio weekend held at Katoomba in July, and organised by the WIA Education Service incorporating the Youth Radio Service. Sixty newcomers were introduced to amateur radio.

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SO-239 Chassis Socket	\$1.50
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"T" Connection	\$2.50
PL-259 to R.C.A. Adapter	\$2.75
Coax Joiner, female to female, male to male	\$2.75
BNC Plugs	\$1.95
BNC Sockets	\$1.75
Belling Lee Plugs	75c
Belling Lee Sockets	50c
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POLYESTER**Size 7" 1800 **\$5.90 — 1200 \$5.30.**Size 5" 1200 **\$4.00 — 900 \$3.00****SINGLE CORE OUTSIDE SHIELDED  
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5" x 3" 8ohm, ideal for small extension speaker for communications equipment.

**\$1.95 each plus P&P****NEW AWA-THORN TV TUNERS**

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MODEL TW-232**

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1910.



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Advertising copy may not be made unless  
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should be sent by certified mail. The editor  
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cluding Letters to the Editor and Hamads,

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or any material, without specifying a reason.

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Trade Practices Act: It is impossible for us to ensure that advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agencies will appreciate the absolute need for them to ensure that the provisions of the Act are complied with strictly. Readers are reminded that, when buying, obtaining or receiving goods from overseas importers, goods listed in advertisements by overseas importers in the Journals, Customs import duties and Sales Tax may be levied on the goods at the time of importation. These amounts, if any, are payable by the purchaser unless the terms of sale state otherwise. The editor has made no specific provision to this effect in his quotation to the buyer or unless other prior arrangements are in force between the buyer and the seller.

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50-52 Islington Street, Collingwood, 3068  
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# amateur radio

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# WIRELESS INSTITUTE OF AUSTRALIA

Federal President: Dr. D. A. Wardlaw VK3ADW

Federal Council:

VK1 Brig. W. K. Roseblade VK1QJ  
VK2 Mr. J. I. Mills VK2ZTM  
VK3 Mr. J. Pearce VK3AED  
VK4 Mr. N. F. Wilson VK4NP  
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VK6 Mr. N. R. Penfold VK6GNE  
VK7 Mr. P. D. Fritsch VK7PF

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Part-time: Col. C. W. Perry, Mrs. J. M. Seddon and  
Mr. P. Simmons (AR advertising).

Executive Office: P.O. Box 150, Toorak, Vic., 3142.  
2/517 Toorak Rd., Toorak, Ph. (03) 24 8652.

Divisional Information (all broadcasts are on Sundays unless otherwise stated):

ACT:

President — Mr. E. W. Howell VK1TH  
Secretary — Mr. Ted Hadrill VK1TR  
Broadcasts — 3570 kHz & 146.5 MHz: 10.00Z.

NSW:

President — Mr. D. S. Thompson VK2BDT  
Secretary — Mr. T. I. Mills VK2ZTM  
Broadcasts — 1825, 3595, 7146 kHz, 28.47, 52.1,  
52.525, 144.1, Ch. 8 and other relay stations: 01.00Z. (Also Sunday evenings 09.30Z and Hunter Branch, Mondays 09.30Z on 3570 kHz and ch. 3 and 6).

VIC.:

President — Mr. E. J. Bugbee VK3ZZN  
Secretary — Mr. J. A. Adcock VK3ACA  
Broadcasts — 1825, 3600, 7135 kHz — also on 6m,  
2m SSB and 2m Ch. 2: 00.30Z.

QLD.:

President — Mr. A. J. Aarsse VK4QA  
Secretary — Mr. W. L. Gilells VK4ABG  
Broadcasts — 1825, 3580, 7146, 14342, 21175, 28400,  
kHz: 2m (Ch. 42, 48): 09.00 EST.

SA:

President — Mr. C. J. Hurst VK5HI  
Secretary — Mr. C. M. Pearson VK5PE  
Broadcasts — 1820, 3550, 7085, 14175 kHz: 28.5  
and 53.1 MHz, 2m (Ch. 8): 09.00 S.A.T.

WA:

President — Mr. L. A. Ball VK6AN  
Secretary — Mr. P. Savage VK6NCP  
Broadcasts — 3600, 7080, 14100, 14175 kHz, 52.656  
and 2m (Ch. 2): 01.30Z.

TAS.:

President — Mr. I. Nicholls VK7ZZ  
Secretary — Mr. M. Hennessy VK7MC  
Broadcasts — 3570, 7130 kHz: 09.30 EST.

NT:

President — Dick Klose VK8ZDK  
Vice-Pres. — Barry Burns VK8DI  
Secretary — Graeme Challinor VK8GG  
Broadcasts — Relay of VK5WI on 3.55 MHz and on  
146.5 MHz at 2300Z. Slow Morse transmission by VKBHA on 3.555 MHz  
at 1000Z almost every day.

Postal Information:

VK1 — P.O. Box 46, Canberra, 2600.

VK2 — 14 Atchison St., Crows Nest, 2065 (Ph. (02)  
43 5795 Tues & Thurs (10.00-14.00h).

VK3 — 412 Brunswick St., Fitzroy, 3065 (Ph. (03)  
41 3535 Sat 10.00-12.00h).

VK4 — G.P.O. Box 638, Brisbane, 4001.

VK5 — G.P.O. Box 1234, Adelaide, 5001 — HQ at  
West Thebarton Rd., Thebarton (Ph. (08)  
254 7442).

VK6 — G.P.O. Box N1002, Perth, 6001.

VK7 — P.O. Box 1010, Launceston, 7250.

VK8 — (Incl. with VK5), Darwin AR Club, P.O. Box  
37317, Winnellie, N.T., 5789.

Slow Morse transmissions — most week-day evenings  
about 09.30Z onwards around 3550 kHz.

VK QSL BUREAUX

The following are the official list of VK QSL Bureaux, all are inwards and outwards unless otherwise stated.

VK1 — QSL Officer, G.P.O. Box 1173, Canberra,  
A.C.T. 2601.

VK2 — QSL Bureau, C/- Hunter Branch, P.O.  
Tenterfield, N.S.W., 2384  
Inwards QSL Bureau, Mr. E. Treblecock, 340  
Gillies Street, Thornbury, Vic. 3071.

VK3 — Outwards QSL Bureau, Mr. R. R. Prowse,  
83 Brewer Road, Bentleigh, Vic. 3204.

VK4 — QSL Officer, G.P.O. Box 638, Brisbane, Qld.,  
4001.

VK5 — QSL Bureau, Mr. G. Luxon VK5RX, 203  
Belair Road, Torrens Park, S.A. 5062.

VK6 — QSL Bureau, Mr. J. Rumble VK6RU, G.P.O.  
Box F319, Perth, W.A. 6001.

VK7 — QSL Bureau, G.P.O. Box 371D, Hobart,  
Tas. 7001.

VK8 — QSL Bureau, C/- VKBHA, P.O. Box 1418,  
Darwin, N.T. 5794.

VK9, 0 — Federal QSL Bureau, 23 Landale Street,  
Box Hill, Vic. 3128.

from dignitaries around the world, worked each member of the NCDXA who had participated in the series of schedules, and generally livened up 20 metres.

From IARU R2 News, August 1978.

## MESSAGES THROUGH THE EARTH

According to W2HR's editorial in Ham Radio, June 1978, a group of atomic physicists predicts that some time this year the first message will be transmitted through the earth, rather than around it, along a beam of neutrino particles from a particle generator. In experiments with the 400,000-megaton-electron-volt proton accelerator in Illinois a 20 microsecond pulse of protons directed into a bar of aluminium yields about 10,000 million neutrinos per pulse resulting from atomic collisions. The beam of neutrinos generates about one reaction per pulse in a bubble chamber containing 25 tons of liquid neon one kilometre away. The average neutrino is capable of passing through most of the matter of the universe without slowing down or losing any of its energy. When a beam of neutrinos is passed through a large volume of water, all along its path some of the collision

products emit a forward cone of Cerenkov photons which can be detected by a light collector-phototube system. Billions of neutrinos from the sun pass through your own body every second, day and night, but an estimate puts about one in 10 years as the interaction with one of the atoms in your body.

## SLOW MORSE QRM

The VK5 broadcast was about to begin "This is VK5WI about to commence the evening slow Morse session, get your pens ready." Then Big Carrier right on frequency "Stand by" says VK5WI, just above the carrier, pause, more carrier, tune up, tune up, so it goes on. After some minutes in sheer exasperation VK5WI says "O.K. if that's what you want, this is VK5WI closing down". Who can blame him!

From SWARS "Feedback" 1978 Convention Issue.

## CORRECTION

Custom Communications apologise for any misunderstanding caused by their October advertisement. They are distributors for Kenwood, and Sola Australian Agents for Swan.

# QSP — TOWARDS YOUR FUTURE

The International Radio Consultative Committee (CCIR), the technical consultative committee of the ITU, has been given the task of carrying out the necessary technical studies and organising a Special Preparatory Meeting (SPM) to prepare a report providing technical bases for the WARC 1979 and for the use of administrations in preparing their proposals.

It must be stressed that the SPM can only concern itself with technical considerations, and cannot make specific proposals for revised or new allocations. It is intended that the SPM shall present a comprehensive and self-contained report consistent with the various Agenda Items of the WARC.

Many administrations see the SPM as an important stage in the evolution of the ultimate determinations of the WARC.

Australia has regarded the SPM as being of particular importance and will be host of a Regional Seminar arising from the SPM in the first half of next year.

Australia has submitted a paper to the SPM relating to the Amateur Service. Canada and the United States of America have also submitted papers dealing with the Amateur Service. The Australian paper contends that it is no longer necessary to preserve a harmonic relationship between bands allocated to the Amateur Service and that the communication capability, and therefore operational effectiveness, of the Amateur Service in the HF bands would be significantly enhanced by allocations at intervals of 3 to 4 MHz between 3 and 30 MHz.

The WIA was invited to provide a delegate as a member of the Australian Delegation to the SPM so that expertise as to the particular requirements of the Amateur Service would be available.

Thus, Dr. David Wardlaw will be a member of the Australian delegation for the first two weeks of the SPM, and Mr. Michael Owen for the remaining two weeks.

The Federal Council at the last Federal Convention accepted the importance of the SPM and budgeted for the costs associated with amateur members of the Delegation. These costs must be borne by the WIA.

The SPM therefore represents a further heavy cost associated with the WARC, but a cost that it is believed is more than justified. Let it never be said in the years to come that the WIA failed to respond to the challenge of the WARC.

D. A. WARDLAW VK3ADW, Federal President  
M. J. OWEN, VK3KI, IARU Liaison Officer

■

## EDITOR'S DESK

Bruce Bathols VK3UV

One wonders why the end of the year always seems to come around so quickly.

It seems almost only like last week that we put together our December 77 issue "Australia's Window on the World".

Anyway, here it is again — Christmas and New Year — and what have we got to show for it?

Well, let's re-cap a little —

Things went along quietly for the first couple of months, then away we went:

We had our Novices using VFOs, next an extension to the Novice segment of 80 metres.

Several joint P&T/WIA committee meetings were held, the system is working smoothly and with each group appreciating the other that much better and ironing out many problem areas.

Renewed interest in respect of Channel 5A has kept a lot of amateurs on their toes — but there is still a long way to go.

OSCAR 8 was launched and performing as it should, and adding extra enthusiasm to our hobby and investigations.

The introduction of RTTY sections in Australian contests has opened up further fields.

Participation in contests, particularly the RD, has been an all time high.

Jamboree of the Air was a huge success with over 3000 scouts and guides taking part.

A proposal for opening up the UHF band for ethnic TV, and proliferation of UHF CB will undoubtedly cause further pressures on amateur operations in that area.

The VK8 boys just missed out on setting a world record on 2 metres earlier this year — will they crack it in the coming DX season?

And so on it goes, amateur radio never stands still, there is always something new to keep one's interest held.

With this issue of AR, we have selected some articles which we hope will be of interest in particular to our many hundreds of up-and-coming and existing Novices, and also for all our other readers.

We have designated this issue our "Special Novice Issue" and have arranged for several hundred extra copies to be printed and be made available to the general public.

The extra copies are available from selected retailers, and also from the WIA, PO Box 150, Toorak, Vic. 3142.

The price for this issue only is \$1.20 PLUS 50c posted, the higher price being to offset the greater publication costs involved.

If you require an extra copy — say as a Christmas gift — please place an order now.

**WHAT NOW OF NEXT YEAR — 1979?**  
The main items at this stage are Channel 5A and UHF TV and of course the WARC in September.

The WIA needs all of the support **YOU** can muster, don't just sit back and let your over-worked Divisional representatives carry the brunt — **GET IN THERE AND HELP!!** — You know what is required and we are only working for all of us.

If Amateur Radio is to continue to survive, it needs **YOU** to get behind it and give it that extra push — in other words — **GET YOUR HEAD OUT OF THE SAND.**

With those few words, the Publications Committee and Executive extend our Christmas and New Year greetings to all.

# WIA NEWS

## ITU/WARC 79 FUND

A letter has been sent to each non-member licensed amateur in the call book records explaining about WARC 79 and soliciting a donation for this purpose and/or joining the WIA.

Many readers of July 1978 AR may have observed from the Federal accounts for 1977 printed on page 32a provision for \$1613 for Amateur Satellites. At the September Executive meeting it was decided to re-name this provision "Satellites and Special Projects". This provision has been increased to \$4613 and includes funds required for Project Asert.

A petition, seeking extensions to the existing amateur allocations on 80 and 40 metres, and signed by 415 amateurs, was sent to the Chairman of the APG Committee No. 2 (Amateur) for back-up purposes in the WARC 79 preparations.

## NOTES OF MEETINGS

### PUBLICATIONS COMMITTEE

At the Publications Committee meeting on 3rd October the passing of Ken Gillespie VK3KG was recorded with a sense of great loss. Ken had been a member of the Committee for many years, with special responsibilities for drafting of AR diagrams and drawings.

Photographs of amateur interest were noted as being an urgent requirement. The meeting decided to print an additional quantity of this issue of AR for sale to the public through selected outlets. Further discussions were held on the possible publication of a VHF book containing reprints of good articles from past issues of AR, advertising, technical articles and many other subjects.

### DONATIONS, WARC 79

The Executive wishes to acknowledge with grateful thanks the receipt of the following donations to the WARC 79 fund:—

F. J. M. Phillips VK2ZQ, \$10; Tumut and District Radio Club (\$2 each from VK2PN, VK2ALZ, VK7ZAA, R. Chapman and the Club), \$10; Eastern and Mt. Districts RC, \$100; Anon, per Federal President at EM and DRC, \$10.

THE EXECUTIVE EXPRESSES CHRISTMAS AND NEW YEAR GREETINGS TO ALL MEMBERS

## ARE YOU AN ACTIVE MEMBER?

Are you an active member,  
The kind who would be missed.  
Or are you just content to see  
Your name down on the list?  
Do you attend each meeting  
And mingle with flock,  
Or do you stay away, then criticise and  
knock?  
Do you take an active part to help and  
work along  
Or are you satisfied to be the kind who'll  
just belong?  
Do you push the cause along and make  
things really tick,  
Or leave the work to others, and talk about  
"The Clique"?

Think this over, member — you know right  
from wrong,  
Are you an active member, or do you just  
belong?

**CAR, TRUCK,  
CARAVAN OR  
TRAILER**

**THERE'S ONLY ONE WHIP...  
SCALAR**

Noise free Scalar M25 in black or white with standard MB base.

Scalar M25 made specially for Ham Ams. Puts on a special 2 metre performance. Scalar M25 is a 3dB mobile designed for use in the 140-175 MHz band. And what a band of callers! A 5/8 wavelength whip with integral loading coil in resilient fibreglass. Stop looking for a better whip than Scalar... there ain't any!!

### 3 MORE WAYS TO SCREW ON A SCALAR

#### MAGNABASE

— a magnetic base, scratch-free. Instant or permanent grip on any flat metal surface.



**TRUNK  
MOUNT** — special bracket holds it rock firm around the boot.

**GUTTERGRIP** — screws on solid anywhere around the gutter of any vehicle.

Whip this coupon back Q.R.Q. to Scalar

Please send  order form for Scalar M25 Ham Mobile with base. Or  literature giving more information.

Please print.

NAME.....

ADDRESS.....

STATE.....

POSTCODE.....



**88's from SCALAR INDUSTRIES PTY. LTD.**

20 Shelley Avenue, Kilsyth, Vic. 3137 (03) 725 9677

N.S.W. 20 The Strand, Penshurst, 2222 (02) 570 1788

QLD. 969 Ann Street, Fortitude Valley, 4006 (07) 52 2594

Buy from Scalar, Vicom or your Ham Gear Retailer

# Well, it had to happen !

## 2m hand-held

### 800ch. Synthesised

144-148 MHz

Palm size



Sooner or later it had to happen. Now Vicom are proud to introduce the first ham hand-held synthesised 2m rig with alphanumeric dial-up of frequencies 144-148 MHz. The palm size (40 x 62 x 165 mm) and 400 gram weight of this NiCd rig makes it ideal for the ham on the go!

RF output power : 1.5w  
 Harmonics : -60 dB  
 Spurious : -70 dB  
 Repeater offset : +600 MHz or -600 KHz  
 Sensitivity : 0.3 uV at 20 dB SINAD

The unit features high quality construction with double sided glass-epoxy PCBs.

And your new hand held comes complete with VICOM 90 day warranty and service back-up.

\$399.

1.5w  
**WOW**

**NEW!**

**MFJ 40T CWP transmitter.**  
 Work the world with 5 watts on 40 meter CW. No tuning. Matches 50 ohm load. Clean output with low harmonic content. Protection circuitry protected against burnout. Switch selects 3 crystals or VFO input. 12 V DC operation. **\$49**

**vfo option \$49**

**5W**

#### CW FILTERS

FT101E filter **\$49.00**  
 TS5205 (YG3395C) **\$57.00**  
 TS8205 (YG88C) **\$57.00**

Popular VCF open-filter meter covers 3-150MHz with power ratings 12/120 watts. Will handle up to 1000w, 50 ohms impedance. Turn, instars, this quality shunt-line instrument is ideal for the shack or for permanent mobile installation.

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HF transceiver, solid-state  
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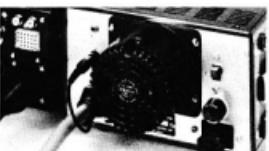


IC-211

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## fun portables

**ICOM Portables** This outstanding group of ICOM portable transceivers puts Amateur communications in your grasp and on the go with high quality ICOM radios packed into extremely compact and rugged die-cast aluminum frames that are built for travel.



IC-402

## Specifications:

IC-402	
Frequency Coverage:	430-2.0 MHz in any four 200 KHz bands
Antenna Impedance:	50 ohms
Power Supply:	13.8V DC negative ground
Curent Draw:	
Tx	AS3, approx. 670mA
Rx	Approx. 100mA with no signal
Size:	103mm(h) x 61mm(w) x 162mm(d)
Weight:	2.0 Kg
RF Output Power:	AS3, 3W PEP, AL, 3W
Carrier Suppression:	Better than 40 dB



70cm



IC-202S

2m

## OSCAR TRANSCEIVE ?

No one could ask for a better OSCAR station than the IC-701 and IC-211 together for a mode "A"; and adding a transverter to the IC-701 mode B or J offers newer, better satellite horizons. Within the ICOM LSI based radios there is the capacity for the technically minded amateur to add his own interface to the radio. This is done with the optional (one transverter, anyone?). In addition, the LSI allows itself to be controlled by a parallel port on one of the increasing number of microprocessors now available for amateur use. Microphones and other accessories are compatible with both radios, such as the RMS remote microprocessor frequency controller. This nifty unit provides memory and frequency control including automatic band change and memories for 4 different frequencies plus auto increment or simple step timing in 100 Hz, 1, 10 or 25 Hz steps.

The 1980's features built into your ICOM radio will mean happy use for a long period of time without becoming old-fashioned. The systems possibilities with the IC-701 and IC-211 are so numerous that even we have not thought of all of them yet!



The popular remote 2m fm rig  
Price: \$450.00

EX-1

The extension terminal for operating the IC-701 with a linear amplifier.  
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The IC-202S features a new style front panel together with the traditional high ICOM quality.

**6m DX is fun  
with the IC-502**

IC-215	2m fm incl. 3 channels	\$245.00
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IC-202E	2m sub portable	\$239.00

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## QUALITY ACCESSORIES from

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## Two quality models:

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Frequency range : 1.8 thru 170 MHz  
 Power rating : 100w pcp  
 Power required : 10-15v dc  
 Sockets : SO-239  
 Price : \$48

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Frequency range : 1.8 thru 450 MHz  
 Power rating : 200w pcp  
 Power required : 10-15v dc  
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DAIWA

The new DAIWA digital multimeter is ideal for the serious amateur. This fine instrument handles DCV, ACV, DCmA, ACmA plus resistance with a high input impedance. Introductory offer, \$129.00.

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of precision  
SWR & pwr  
meters



## COAX SWITCHES

Coaxial Switches  
 2 Position/Model CS-201 4 Position/Model CS-401

Professionally engineered cavity

Construction: High isolation

Power Rating: 2.5 kW PEP, 1 kW CW

Impedance: 50 ohms

Insertion loss: Less than .2 dB

VSWR: 1.1:1

Maximum Frequency: 500 MHz

Isolation: Better than 60 dB at 500 MHz;

better than 50 dB at 450 MHz; adjacent terminal

Connectors: SO-239

CS-201 \$26 CS-401 \$61.00

Write for literature.



## QUALITY SPEECH PROCESSORS

Increases talk power with splatter free operation.  
 RF clipping assures low distortion. Simply install between microphone and transmitter.

Talk Power: Better than 6 dB

Clipping Threshold: Less than 2 mV at 1 KHz

Bandwidth: 2200 Hz at 6 dB down

Frequency Response: 300-3000 Hz at 12 dB down

Distortion: Less than 3% at 1000 Hz 20-50 clipping

Output Power: More than 50 mW at 1 KHz

Power Requirement: 240 VAC 50 Hz, 1.4 W, or 13.5 VDC, 55 mA

Dimensions: 150 x 70 x 150 mm; 5 x 2.5 x 5 in.

Model RF550 (filter type) \$184.00

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Model MC350 Speech Compressor \$ 99.00

## LOW PASS FILTERS



## QUALITY LOW PASS FILTERS (3 SECTION)

## FD50L FD50M

Frequency cut-off 52 MHz 32 MHz

Power rating 100w cw 500w cw

200w pcp 200w pcp

Insertion loss 0.5 dB 0.5 dB

Price \$20 \$39

## ANTENNA DIRECT COUPLERS READING SWR-PWR METER



DAIWA

## CROSS NEEDLES

## MODEL CNW-217

Freq coverage : 1.8 thru 30MHz

Input power : 100w CW, 200w pcp

Input impedance : 50 ohms unbalanced

Output impedance : 10-300 ohm unbalanced

\$199

## MODEL CNW-417

1.8 thru 30MHz

200w CW, 500w pcp

50 ohms unbalanced

10-300 ohms unbalanced

\$245

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## COMPLETE ATTRACTIVE WITH CONTROLLER

## DR7500

## DR7600

Rotation time 60 secs

64 secs

Rotating torque 500 kg/cm

2000 kg/cm

Braking torque

4000 kg/cm

Vertical load

200 kg

Cables

60 meters

Weight

4.5 kg

Price (incl. control unit)

\$199

Cable for above \$1 per metre.

## ANTENNAS &amp; ACCESSORIES



## MFJ-901 Versa Tuner

The 901 features the same efficient air wound coil of the 941 — for more watts out! The coil inductor has 12 positions. The tuner will match everything from 160 to 10 meters. 200 watts RF output. 1:4 balun and SO-239 connectors. Works great mobile.

**112.00** Call for yours today.

**This NEW MFJ Versa Tuner II . . .**  
has SWR and dual range wattmeter, antenna switch, efficient internal balun, built in balun. Up to 300 watts RF output. Matches everything from 160 thru 10 Meters: dipoles, inverted vees, random wires, verticals, mobile whips, beams, balance lines, coax lines.

Only MFJ gives you this MFJ 941 Versa Tuner II with all these features at this price. A SWR and dual range wattmeter (300 and 30 watts) are built in. Internal balun, RF power output for simplest matching.

A new efficient output inductor (12 positions) gives you better 2:1 coax matching. 100 watts more output with a tapped coil and lower impedances.

A new efficient antenna switch (2:1 or 4:1) gives you 10 times as much reflected power with a 1:4 balun.

A 1:4 balun for balance lines. 1800 volt capacitive spacing. Mounting brackets for mobile installations (not shown).

**MFJ-1610 10 RANDOM WIRE TUNER FOR LONG WIRES.**

**\$79**



**1.8 thru 30 MHz. Up to 300 watts RF. Matches high and low impedances. 12 pair inductor. SO-239 connectors. 2x2x1 inches. Matches 25 to 2000 feet at 1.8 MHz. Does not have coax lines.**

**MFJ**

**\$139 160-10M  
TUNER**

**JAYBEAM**

VHF/UHF BEAM ANTENNAS

Model	5Y/2M	8Y/2M	10Y/2M	10XV/2M	18/70	48/70	88/70	D8/70
Type	Yagi	twin						
Band	2m	2m	2m	2m	70 cm	70 cm	70 cm	70 cm
Gain dBi	7.8	9.5	11.4	11.5	14.9	15.7	18.5	12.5
No of el	5	8	10	10	18	48	88	2x8
Horiz beam width	58° <sup>o</sup>	47° <sup>o</sup>	37° <sup>o</sup>	38° <sup>o</sup>	28° <sup>o</sup>	26° <sup>o</sup>	19° <sup>o</sup>	45° <sup>o</sup>
Max power	1 Kw							
Length metres	1.25	2.35	3.15	3.15	2.55	1.95	3.05	1.15
Mass Kg	1.8	3.8	4.5	5.9	3.4	2.7	4.7	2.5
Impedance ohms	50	50	50	50	50	50	50	50
Price \$	43.00	51.00	84.00	84.00	71.00	83.00	102.00	64.00

**HUSTLER**

**HF MOBILE  
RESONATORS**

**well designed**

Model	Band	Price
RMB0	80m	\$30.00
RM40	40m	\$25.00
RM20	20m	\$16.50
RM15	15m	\$16.00
RM10	10m	\$15.00
M02 fold-over mast		\$33.00
RSS-2 medium duty spring		\$13.00
BN-1 deluxe bumper mount		\$25.00

## 6m beams

6 METRE BEAM, 5 ELEMENTS,  
1 KW MAX, GOOD QUALITY  
\$159

6 metres DX is great fun!

### NAGARA TRAP VERTICALS

Model V3.0 5 band trap vertical:  
Height: 6.7m  
Weight: 2.2kg  
Max Power: 1 Kw  
Impedance: 50 ohms \$129

Model 4Jr 4 band trap vertical:  
Height: 5.2m  
Weight: 1.8 kg  
Max Power: 1 Kw  
Impedance: 50 ohms \$ 99

\$25.00  
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Bumper mount kit  
AS-NK  
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Bumper mount kit  
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M22T 1/4 wave 2m mobile whip \$7.00  
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Listener-3 short wave antenna for the serious SWL \$49.00

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BL50A RAK 50 ohm, 4 Kw model for dipoles \$32.00  
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### TRAP DIPOLES

Midy VNB 80 thru 10m trap dipole, 23m long \$11.00  
AL24DXN 20 and 40m trap dipole \$70.00  
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### PARABOLIC DISH

PARABOLIC DISH FOR 432 & 1296 MHz A professionally engineered dish with 12 db and 20 db gain on 70 cm and 1.2 GHz. \$349

### DISCONES

GDX-1 80 thru 480 MHz commercial discone \$55.00  
SCAN-X 65 thru 550 MHz receive only \$39.00

## There is no substitute.

**hy-gain**  
Amateur Radio Systems.

Distributed by VICOM

Super  
3-Element Thunderbird  
for 10, 15 and 20 Meters  
Model TH3M3k

Hy-Gain's Super 3-element Thunderbird delivers outstanding performance on 10, 15 and 20 meters. The TH3M3k features separate end matched 1:1 traps and a central section matched with 52 ohm coax. Hy-Gain's Matched section has tapered impedance for most efficient 3 band matching, and provides DC ground to eliminate precipitation static. The TH3M3k has a 1:1.5 SWR at 4:1 F/B ratio, and SWR less than 1.5:1 at resonance on all bands. Its mechanically superior construction features taper swaged slotted tubing for easy adjustment and larger diameter. Coax is equipped with heavy ultra-conformal to clamp. Hy-Gain ferrite BN-86 is recommended for use with the TH3M3k.

TH60XX beam \$299  
TH3J beam \$210  
TH5M5 beam \$259  
2031a beam \$189  
2048a beam \$249  
HyQuad \$269  
18AVT vert. \$149  
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**Electrical**  
Gain—average 8.7dB 8dB  
Front-to-back ratio 25dB 25dB  
SWR (at resonance) Less than 1.5:1 Less than 1.5:1  
Impedance 50 ohms 50 ohms  
Power rating Max legal Max legal

### FAMOUS RINGO

The RINGO RANGER ARX-2 is a 2m gain omni-directional antenna with 5 half waves in phase and a 1/8 wave matching stub. The Ringo gives an extremely low angle of radiation for better signal coverage. It is tunable over a broad frequency range and perfectly matched to 52 ohms. Price \$49.

4dB gain with reference to half-wave dipole.  
6dB gain with reference to quarter-wave whip.

**RINGO  
RANGER**

## ALL ABOUT DIODES

by George Stanley  
(Submitted by Bruce Marsh VK3ZHI)

Diodes may seem simple to you as they have just two leads, but do you know how to recognize and test the following: PN, Zener, Avalanche, SRD, Tunnel and PIN? In order to keep the number manageable I'm leaving out light-emitting four-layer, and microwave mixer diodes.

BN-BIOBEC

**PN DIODES**  
Let's take the most basic first: the common, garden-variety PN junction diode. This is man's attempt to make a one-way switch. That is, ideally, no current would flow when the device is reversed biased and there would be no resistance when it is forward biased. Figure 1 shows the ideal.

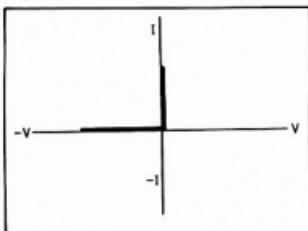


FIG. 1: Ideal Diode

Figure 2 shows what's practical for a germanium and silicon diode. Notice that very little current flows until a threshold voltage is reached (at room temperature approximately 0.2 for Ge and 0.6 for Si) and then the current through the diode

TABLE 1: Diode/Transistor Circuit Waveforms

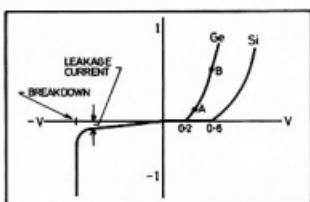


FIG. 2: V-I Characteristics

increases rapidly without much further increase in the diode voltage.

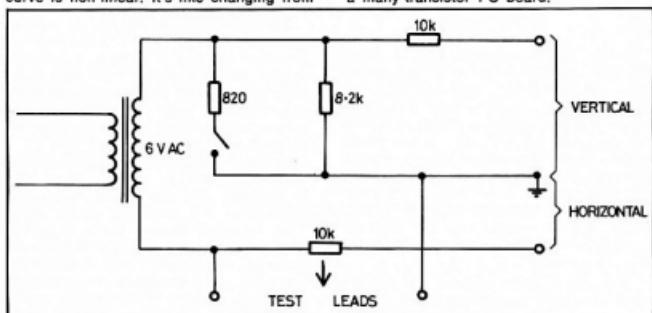
Testing a PN diode can be done in a number of ways. For example, an ohmmeter can be used to check the forward and reverse conductance. That is, it should show a high resistance when the diode is reverse biased and a low resistance when it is forward biased. You might wonder why the readings change somewhat when you change scales or use a different ohmmeter. The reason is because the diode curve is non-linear. It's like changing from

operating point "A" to operating point "B" in Figure 2.

A more interesting way to test diodes is to display the V-I characteristic (Figure 2) on an oscilloscope. This can be done using the tester of Figure 3 which we will use again in a future article on testing transistors.

Examining Figure 3 shows that the vertical signal is proportional to the current through the device while the horizontal signal is proportional to the voltage across the device. (The two 10 k resistors are only to protect delicate diodes or transistors if shorts develop in the scope cables).

Using this tester and the associated table of waveforms you can rapidly determine if a diode is open or shorted. It also tells if there is associated resistance or capacitance from neighbouring components such as on a PC board. This is a valuable tester which really comes into its own when you want to rapidly test the emitter-base and base-collector diodes on a many-transistor PC board.



**FIGURE 3: Diode/Transistor Checker**

Applications of the PN diode are many. Leading the list are rectifiers, switches and temperature compensators. The garden-variety PN diode has a negative TC, or temperature coefficient, and this property is often used to counteract the positive TC of the Avalanche diode. Figure 4 shows the reason for the —TC. When heat is applied, the diode tries to turn on harder and its resistance falls. The current is limited by the 10 k resistor so the diode voltage *must* fall. Try it yourself. All you need is a battery (borrow the one out of your wife's radio), a resistor, soldering iron for heat, and your multimeter to track the voltage as you heat the diode.

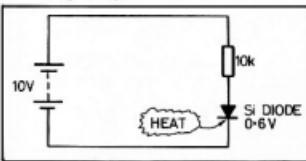


FIG. 4: Diode Voltage and Heat

#### ZENER AND AVALANCHE DIODES

Both Zener and Avalanche diodes are breakdown diodes (see Figure 2) but the Zener diode has a *negative* TC (the breakdown voltage falls as the temperature is raised) while the Avalanche diode has a *positive* TC (the breakdown voltage rises as the temperature is increased). This difference comes about from the different way breakdown occurs. Simply put, in the Zener diode (up to about 5V) electrons are freed by the applied field being strong enough to suddenly rip electrons out of the lattice structure and put them into the conduction band.

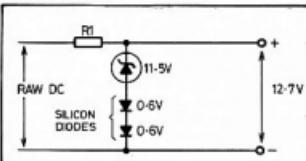


FIG. 5: Avalanche Diode Temperature Compensation

In the Avalanche diode (above about 7V) the energy gap is wider and before Zener action occurs, free electrons are accelerated to a velocity high enough to knock out lattice bound electrons during collisions. In the 5-7 volt region breakdown diodes often exhibit a nearly flat TC because both processes are occurring and compensate each other to a certain extent. Figure 5 shows how a PN junction diode with its *negative* TC can be used to compensate the *positive* TC of an Avalanche diode.

The diode tester (Figure 3) can be used to check breakdown diodes if they break down below about 9 volts (6.3 volts of the transformer x1.414).

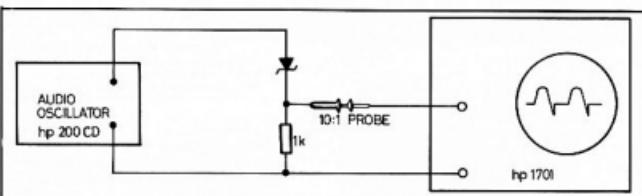


FIG. 7: SRD Display Set-up

#### STEP RECOVERY DIODE (SRD)

The Step Recovery Diode is a special PN junction diode. It has heavy doping near the junction which gives it a long charge storage, but when carrier recombination ends (electrons falling into holes) it ends abruptly and the device switches off very rapidly. Figure 6 shows the current through the device as a function of time.

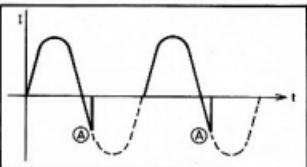


FIG. 6: Step Recovery Diode Waveform

Since this diode generates a very sharp "on-to-off" transition (Point A, Figure 6) it is often used as a harmonic generator. Testing can usually be done with the diode checker or with an ohmmeter (watch you don't use the Rx1 scales as it may put out a very high short circuit current). Look for opens or shorts. If you want to experiment a little, you can display the waveform of Figure 6. You will need a high frequency scope (50 MHz or higher) and at least a 500 kHz oscillator driving source. The arrangement of Figure 7 shows the detailed connections.

#### TUNNEL DIODES

Tunnel diodes are not as complicated as you have been told. Figure 8 shows their V-I characteristics.

Because of very heavy doping, the gap between electrons on the N material side and holes on the P material side of the PN junction is much narrower than in the plain PN junction. The result is electrons tunnelling after holes and vice versa even without bias. When forward bias is applied, conduction starts immediately as conduction band electrons (N material) find themselves next to valence band holes (P material) and the tunnel occurs with vengeance. This continues during region 1 on Figure 7. Current peaks at point 2 and then decreases because the gap between N side electrons and P side holes increases and becomes too wide for tunnelling. Current falls off very rapidly until it intersects the "normal" diode curve at 3.

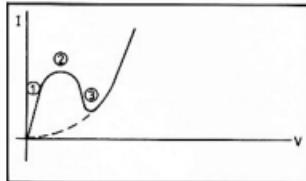


FIG. 8: V-I Characteristics of Tunnel Diode

Many tunnel diodes can be tested using the diode checker of Figure 3, but put the switch in the "In Circuit" position to obtain the proper current/voltage relationship.

#### THE PIN DIODE

The PIN diode consists of P material, Intrinsic material and N material. The intrinsic material is quite wide and is the key to its operation which is as a microwave attenuator. In a typical application the PIN is placed across microwave transmission line and a DC bias is applied to the diode. This bias injects a large number of holes and electrons into the intrinsic region. This large amount of stored charges means the diode continues to partially conduct even during the reverse bias part of the RF cycle. This is the key to its application. Note it does not act like a diode but rather as variable resistor. The amount of resistance (attenuation) is a function of the d- forward bias, i.e. the more bias, the more stored charge and the greater the attenuation.

Failures are usually by shorting as it's difficult to provide a large heat sink in the middle of a microwave transmission line. However, sometimes after shorting the diode will open internally due to the heat produced when it first shorted. You can expect to find both situations. Not only are PIN diodes somewhat delicate but you have to be careful soldering them into the circuit as you don't want to set up a mismatch on the transmission line.

There are at least as many diodes I've left off as I've covered, but hopefully this short article will give you more insight into these fascinating devices. In a future article I would like to cover rapid transistor testing.

(Reprinted with kind permission from "Benchmark Briefs", a Hewlett-Packard Service Publication.)

# QSLs — THE HOMEBREW WAY

J. T. Higson VK3ABW  
24 Stapley Crescent, Chadstone, Vic. 3148

Over the years the problem in obtaining reasonable QSL cards at an attractive price has been a problem at this QTH. Prices are always geared to the amount produced, and small orders did not justify the outlay. In addition, a design cannot be changed without additional expenditure. This naturally led the writer to seek elsewhere, and the only way out was either to silk screen, or use some photographic method. Since one of my hobbies is photography, I decided to use my equipment to produce a suitable QSL card on postcard size double weight photographic enlarging paper.

Since this article will prove of interest to many who do not possess high quality dark room equipment, it was decided that the final prints should be produced using the minimum photographic requirements. Hence, a precision high definition flat plane lens is not necessary. A master positive is produced by using draftsman's tracing paper or mylar sheet as a semi or transparent base. The actual size of your card is determined by drawing a pencilled square, and within this square you will place all the information required. Fig. 1 "A" and "B" show the appropriate lettering in layout which was done with a product by the name of Letraset. This material is a rub on lettering system which transfers to any base, such as the mylar sheet, by rubbing with a soft blunt pencil. Some practice is needed to acquire the necessary skill to apply the lettering in a neat straight line. Squared graph paper under the base medium is a must. Letraset is of course available in various sizes. If you intend to include drawings, use only a base that will take an Indian ink.

The drawings are usually traced, unless you are something of a commercial artist. I usually trace the drawings first because a mistake here does not waste the Letraset.

When the master is finished, your photographic skills will begin.

A negative must now be made with IAH4 Ilfolith or Kodalith. This is a high contrast blue sensitive sheet film which can be handled in a bright red safe light. This material can be obtained from "Photo-Scope", 2 Macrina Street, Oakleigh. It is supplied in 25 sheet packs in 4" x 5" or larger. I doubt whether lesser quantities are procurable since it is a professional material.



FIGURE 1A

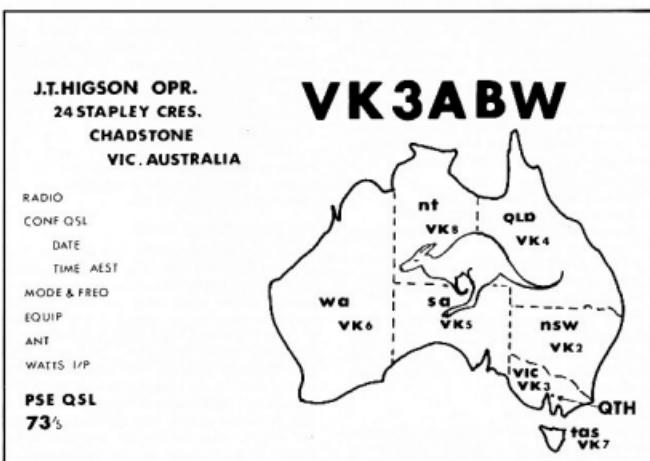


FIGURE 1B

This material is developed in a lith developer and fixed in a fixing solution available from the same source. The developing solution is made from two solutions "A" and "B" and only the amounts needed of

the two are mixed prior to use. This solution once mixed keeps only a few hours. The developer contains alkalis which could reach a pH value of 10 to 13 and may trouble sensitive skins — so use print

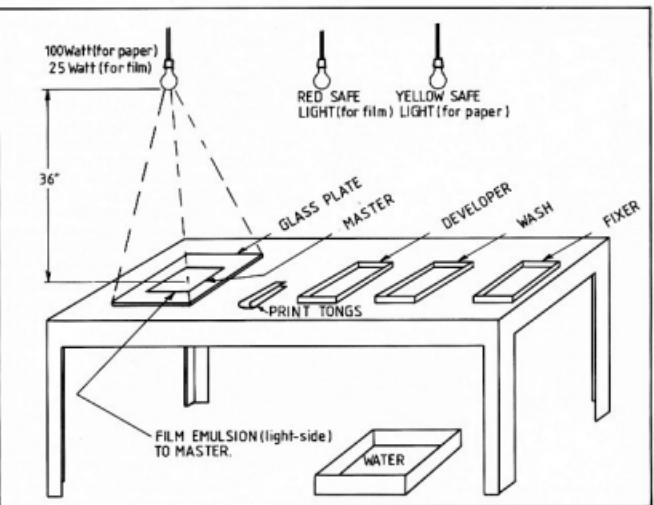


FIGURE 2: Bench Layout.

tongs.

There are four steps in processing:

1. Development
2. Wash
3. Fixing
4. Final Wash.

Do not use an acid loaded stop bath. This will produce small bubbles on the surface of the film due to the reaction with the alkali, and tends to create pin holes on the negative. It is better to use a plain water wash.

Now to the procedure in producing the negative — referring to Fig. 2, which shows the layout on the work bench, the equipment you will need is as follows:

- 25 watt clear lamp for film
- 100 watt clear lamp for paper
- 15 watt bright red safe light for film
- 15 watt yellow green safe light for paper
- Print tongs
- 3 10 in. x 8 in. trays (must be plastic)
- Sheet glass (old side window from car)
- 1 bucket of water.

(Safe lights should be purchased from photographic suppliers. Be sure that you purchase the bright red bulb, and not the low intensity one usually used with high speed ortho stock.)

#### PROCEDURE — FILM

Suspend the 25 watt bulb about 36 inches above the bench in a central position in line with the master and switch red safe light on. The first developing tray need not be 10 in. x 8 in., but only large enough to fit the film size. (The tray for the paper developer must be 10 in. x 8 in. because the developer will quickly exhaust when 50 to 100 papers are developed.)

Mix enough "A" and "B" solutions of the Ilfolith developer to half fill the tray.

NYLON TIPPED PEN is the only medium that will write on the surface, when the time comes to fill in the details of a QSO.

To proceed, the developer needed is a normal paper developer, not the previous lith developer. This is available with instruction from the previously mentioned source.

#### PAPER PROCESSING

The safe light needed now is the yellow green photographic safe light. The three 10 x 8 inch trays are prepared and a final bucket of water to load the prints after fixing period. The fixing period will depend on the main chemical used in the fixer. Rapid fixers that fix in less than one minute, may use Ammonium Thio Sulphate. Slower fixers use Hypo which is short for Sodium Thio Sulphate which will take ten minutes to fix. I prefer Ilford Rapid Fixer. The second bath must contain a stop bath. This can be a one per cent solution of acetic acid, or one of the commercial compounds sold by photographic suppliers. This is necessary in order to stop development and prevent the alkali-loaded developing solution being carried to the fixing bath. It was allowable in the previous process because only a few were being done.

You will now need the 100 watt bulb because the emulsion of the paper is much slower than the film. You may have to adjust the distance in order to satisfy your patience. I would adjust the exposure time to 3-4 seconds noting the distance of the light from the paper for future occasions. Ilford paper is excellent for maintaining its speed relationship from batch to batch. Exposure accuracy here is not important because no middle tones are involved. You require only a black and white finish. If you under expose the lettering will be grey rather than a deep black. If you over-expose too far the lettering will become unsharp or to run into itself. The correct exposure will give very sharp lettering and a dense black silver emulsion.

Note the correct exposure time and make a full negative, develop and fix as before, but wash the negative for 15 minutes, then hang to dry.

#### PRODUCING THE CARD

Many of you who will be interested in this process will not possess a photographic glazing and drying machine. Therefore the normal paper base supplied with various surfaces will not be suitable for air drying. Unfortunately, old style papers dried in this way will shrink unequally. However, the photographic industry has come to your rescue with a new paper called Ilfospeed. The paper that supports the emulsion in this process has a resin base and does not absorb water, only the emulsion. This paper is a medium weight obtainable in glossy and semi-matt surfaces from the source mentioned previously. Indeed, this paper is now replacing the older style, and will be the only type on the market in the future. Since only the surface emulsion is wetted the paper dries quickly and remains flat and glossy. In the old process the papers had to be glazed using a polished plate. If you decide on glossy, a

#### TONING

There are various methods of changing the black photographic lettering of the black silver into another colour. A popular method is the sulphide-ferricyanide process which gives a red-brown finish. The silver is changed to a silver sulphide which is the most stable of all finishes, passing that of ink dyes. The silver image can also be changed to blues, reds and others. Any photographic formulae book will explain many of the methods. Also mordant dye methods can be employed changing the image into brilliant colours similar to colour work. This system uses dyes which cause the silver image to react to derivatives of the chemical groups of paraphenylendiamine. Commercial toners are available from the photographic suppliers and it would be advisable to rely on these. ■

## **ANOTHER CW FILTER**

Ivan Huser VK5QV  
40 Flinders Ave., Whyalla Stuart, 5608

A simple aid to CW reception, this filter gives a choice of centre frequency and band-width. No claim or originality is made by VK5QV for the circuit.

Thumbing through some old copies of 73 magazine recently, I came across an article describing a simple CW audio filter. This article was in fact a reprint of the original by VE3EXA, published in "The Ground-wave" (April 1975), the official bulletin of the Ottawa Amateur Radio Club.

The original circuit used some rather odd values of components, but design formulae were given and with a little time spent on calculations, circuit values were evolved to give comparable performance with readily available components.

The filter is basically an active type using a single parallel tuned configuration, the heart of the filter being a "gyrator".

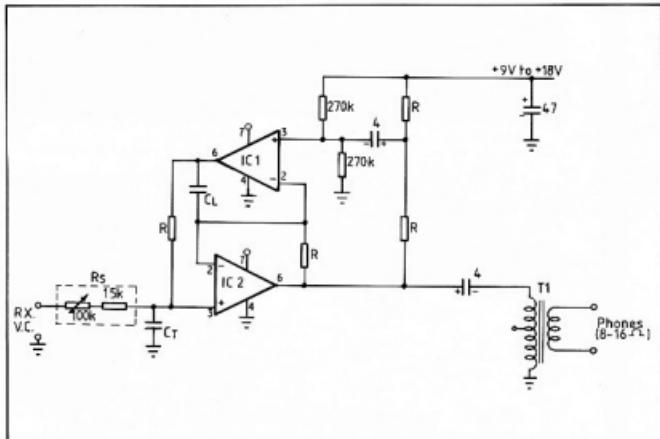
Capacitor  $C_1$  is gyrated to give an equivalent inductance ( $L_{\text{equiv}}$ ) which is connected in parallel with tuning capacitor  $C_t$  to form the parallel tuned circuit.

The Q of the circuit and hence the bandwidth can be controlled by shunt resistance  $R_s$ . Using values for  $R$  and  $C$  as shown in Table 1, an equivalent inductance of 1.8 Henry was achieved which, when paralleled with  $C_t$  (0.022  $\mu$ F), gave a resonant frequency of approximately 800 Hz.

Table 2 shows how the Q and bandwidth varies with values of  $R_s$ . It has been found that with Q's greater than about 25, ringing can become a problem and with the extremely narrow bandwidth, some musical signals will in fact disappear outside the bandpass, thus making the filter ineffective. The narrow bandpass also makes receiver tuning quite difficult.

The centre frequency can be chosen to suit the preferences of individuals and design formulae are therefore included. Perhaps several values of  $C_f$  can be switched to give a selection of frequencies if so desired.

Sufficient output can be obtained to drive headphones or a loudspeaker at low level.



## FIGURE 1

All resistors 1/4 watt 5%  
CT, CL polycarbonate or similar  
T1 small audio output transformer  
IC1, IC2 741 Operational Amplifier.

The value of supply voltage is not critical, and the unit will operate satisfactorily on voltages between 9 and 18 volts.

If you require something to improve the signal to noise ratio on CW signals, this may well meet your need.

## FORMULAE

$$L_{equiv} = R^2 \cdot C_1$$

$$f_0 = \frac{1}{2\pi\sqrt{1-\text{equiv. } G}}$$

$$Q = \frac{R_s}{\pi f_0 L_{\text{equiv}}}$$

$$BW = \frac{f_0}{2}$$

TABLE 1

TABLE 1  
R = 6.8k L equiv. = 1.8H  
Ct = 0.022 fo = 800 Hz  
Cl = 0.039 Q: See Table 2  
BW: 100 Hz

第六章

Rs (k ohm)	Q	BW (Hz)
15	3.3	240
15 + 50	14	55
15 + 100	25	31
15 + 150	37	22

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This book is for the comparative newcomer to electronics, with some knowledge of transistor circuits, wishing to move on to an understanding of integrated circuits. Ian Sinclair first describes their principles and construction, then moves on to their many different uses. Many examples are given of practical integrated circuits. Both linear and digital integrated circuits are covered, and there is a brief

introduction to digital circuit techniques for the beginner unfamiliar with this type of circuit. The operation and uses of several specialised types of integrated circuits are also described. The book is copiously illustrated.

### BEGINNER'S GUIDE TO RADIO – King

This new edition of *BEGINNER'S GUIDE TO RADIO* continues the work of its predecessors, which have given many thousands of readers a sound basic knowledge of radio principles and practice. Gordon King has again completely rewritten the text in order to keep up to date with radio technology while reorganising and improving the description of fundamental principles.

The book takes you in logical steps from the theory of electricity and magnetism to the sound you hear from the loudspeaker. It describes the nature of the radio signal, what is involved in transmitting and receiving it (including stereo broadcasting), and what kinds of equipment are needed. Then it examines the components of a receiver, and how they are built up into circuits that will do the various jobs required. Finally, it outlines the improvements that are incorporated in modern (especially hi-fi) receivers and loudspeakers.

Written in a non-technical, highly readable style, with a minimum of mathematics this guide provides the newcomer to radio with an enjoyable introduction to the subject: it will open the door to further reading and to greater skill in handling radio equipment, whether for work or leisure.

### RADIO CIRCUITS EXPLAINED – King

Circuits used in modern radio receivers are examined in detail ranging from the simple transistor radio to the specialised hi-fi receiver. The book will provide a clear understanding of principles and operation and design parameters of contemporary sets. Available to radio and audio service technicians, to the student and to anyone interested in radio.

### 110 INTEGRATED CIRCUIT PROJECTS FOR THE HOME CONSTRUCTOR – Marston

A completely rewritten edition containing a practical introduction to five specific integrated circuits. The projects range from simple low-level amplifiers to precision measuring and indicating instruments, and include a host of unusual gadgets. All integrated circuits are internationally available and all circuits have been fully evaluated by the author. The book should be of equal interest to the amateur, the student and the professional engineer.

### OP-AMPS – THEIR PRINCIPLES AND APPLICATIONS – Dame

This book is intended for home constructors and other electronics enthusiasts who require information on operational amplifiers in order to use them in conventional circuits. The text is written in an easily readable and non-mathematical style and is profusely illustrated with helpful circuit diagrams. A useful glossary of terms is included.

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# 2 WATT 80 METRE SOLID STATE TRANSMITTER

R. A. Sugden VK2ZHS/NAT  
38A Princes Street, Bexley 2207

During conversation both on and off air I found considerable interest shown, particularly by Novices, in a small transmitter that I had constructed when I first obtained my Novice licence.

The transmitter consists of a Pierce oscillator using a BC109 transistor which drives a 2N3137 power amplifier. The PA output transformer (L1, L2) is wound on a toroid and the complete transmitter fits easily on a piece of single-sided fibreglass board about 3 in. by 4 in.

The oscillator stage operated well when modern plated crystals were used, but when some old re-ground pressure types were tried the oscillator refused to operate. This was cured by increasing the value of  $C_X$  from about 220 pF to 1200 pF. If plated crystals are to be used exclusively the capacitor can be reduced to 220 pF or a value which gives good chirp-free output.

Much empirical type design took place with the PA stage and quite a few different toroids were tried before settling on an Amidon type T-80-2 mix 2. These toroids are available from a Sydney AR advertiser.

The primary winding L1 was made by twisting four pieces of 26 gauge enamel wire together using an eggbeater type hand drill. Eight turns of this wire was wound on and evenly spaced over the full circumference of the toroid.

Three pieces of 26 gauge enamel are then twisted together and eight turns are wound over L1. This forms the secondary L2 of the transformer. The individual

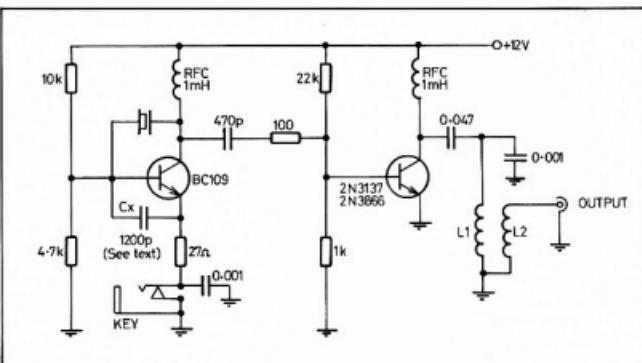


FIGURE 1

strands are well cleaned of enamel, tinned, passed through the board and soldered.

I wound the toroid from stranded wire as this was easier to get on to the toroid than solid wire.

The output transformer was quite broad in tuning and 1000 pF was found to give maximum output. L2 of the transformer was terminated with a 75 ohm load and the output was monitored using a simple diode voltmeter (see ARRL Handbook). Different values of capacitance were tried until maximum output was achieved.

The oscillator stage was found to develop quite an amount of power (for a BC109). When tested, the output of the

oscillator was terminated in 470 ohms and 560 mW resulted. The BC109 ran hot at this power level and the output was reduced to 300 mW in the final version. I tried two other transistors — 2N3553 and 2N3866. These worked O.K. and gave about the same power.

Reports on air have been good for 2 watts, the transmitter keys well and is free of chirp and clicks.

Good DX!

(Note: In view of the simplicity and low Q of the PA output transformer, this transmitter may well produce significant output on harmonics of the chosen frequency. A good aerial tuner will be essential to minimise this problem.—Ed.)

## TRY THIS

WITH  
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### AUDIO COMPRESSOR

Here is an audio compressor suitable for insertion in the microphone lead. The circuit was originally published in PAANO, 9, 1976. No performance details are available.

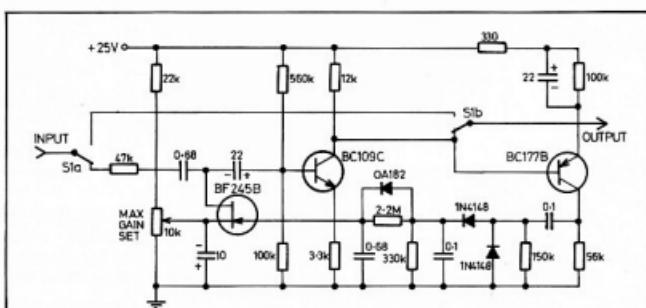


FIGURE 1

# TRANSISTORS – WHAT DO THEY REALLY “LOOK” LIKE?

Roy Hartkopf VK3AOH

If you are one of the many people who feel they don't really understand how a transistor works, don't be discouraged. Even some so-called experts — people who think they are good enough to write school textbooks — have no more idea how a transistor works than the next door cat. The trouble is that many of these people get involved in fancy mathematics and formulae without having a basic picture in their minds as to how a transistor really works.

There are two ways of looking at transistors. The first picture is a fairly common one, that of visualising a transistor as a combination of two diodes back to back. This is shown in Fig. 1.

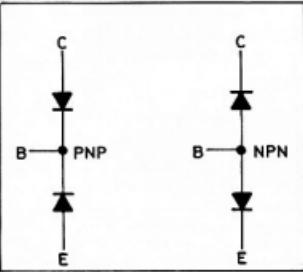


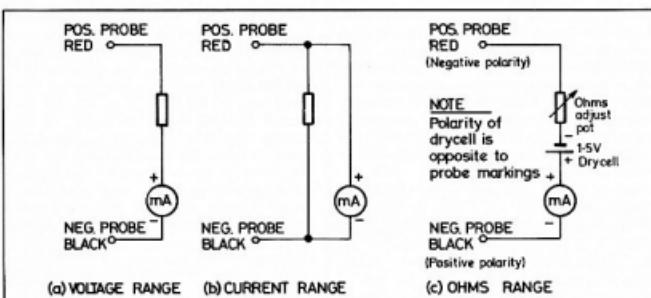
FIGURE 1

This is the kind of picture you get when you are checking a transistor with an ohmmeter. This incidentally is an excellent way of testing a transistor.

When using the ohm-meter section of a multimeter to test transistors you must remember that the actual polarity supplied by the meter is the opposite to the normal working of the probes. To see how this occurs refer to Fig. 2.

The probes are arranged to suit the meter movement polarity. However on the ohms range a battery (1.5V dry cell) is used to provide a current source and its polarity as seen at the probes is opposite to that marked on the meter.

If the positive lead of the ohm-meter is connected to the base of a NPN transistor we will get a reading of a few hundred ohms to both the collector and the emitter. If the positive lead (negative probe) is placed on either the collector or the emitter there should be no reading to either of the other two terminals. The only exception is in some very large power transistors and the older type germanium transistor where there is some leakage cur-



Above: FIGURE 2

rent. But it should be very small compared to the reading in the other direction. From now on we will talk about the NPN transistor, but the PNP one is exactly the same except that all the voltages are reversed, the collector being negative instead of positive. Getting back to the NPN transistor, this will have a positive voltage on the collector and a slightly positive voltage on the base. We will look at the base voltage first. According to the ohmmeter test which we did before, the transistor looked as if it was made up of two forward biased diodes. Since the collector voltage is higher than the base voltage the one diode will be cut off but the second diode — between the base and the emitter — will still look like a forward biased diode. To put it very briefly the forward biased diode will not carry any current at all until the threshold is reached. This is about .2 volt for a germanium and .6 volt for a silicon transistor. Above this level the current increases very quickly and the effective resistance of the base of the transistor goes down very rapidly. If the voltage is increased to about 1 volt the current can be up to half an amp, which gives a forward resistance of about two ohms. This is of course far too much base current for the normal transistor. The point to realise is that the voltage input gives no indication of what is happening with the transistor. The only thing which matters is the base CURRENT. And the collector current is proportional to the base current over the working range of the transistor, but has no relation to the base voltage. This is why a transistor is known as a current operated device. Valves and FETs on the other hand are voltage operated devices and the output current is proportional to the input voltage.

So far we have explained what the base input of the transistor looks like but this does not explain how the rest of the transistor actually works. To do this we

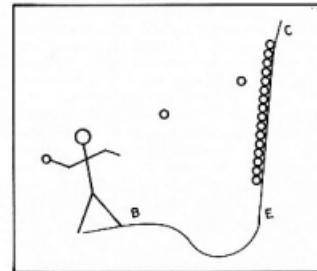


FIGURE 3

need another picture. Fig. 3 shows a rough sketch which may give some idea of what goes on. Imagine a steep cliff with a lot of loose rocks on it. A boy comes along and starts to throw stones at the face of the cliff. Every time he throws a stone it dislodges a whole landslide of loose rocks which tumble down the cliff face. For every stone which hits the cliff face maybe ten or twenty or fifty rocks come tumbling down. An this is exactly what happens in the transistor. For every electron which flows into the base there are twenty, or fifty, or several hundred electrons which flow from the collector to the emitter. And this ratio is constant over the working range of the transistor and this is what is known as the Beta or current gain of the transistor.

If we keep these two pictures in mind we will have a fair idea of the basic principles on which a transistor works. For checking with an ohm-meter out of a circuit it looks like a couple of diodes back to back, and for visualising how it works we have the picture of a boy throwing stones at a cliff and causing an avalanche of rocks to come tumbling down.

(Reproduced by permission from "Zero Beat".) ■

# TVI FILTERS – THE HIGH PASS TYPE

R. Champness VK3UG  
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In the excellent December 1977 issue I read an anonymous article entitled "An HF TVI Suppression Technique". The techniques described in this article are used increasingly in the war against TVI. Although the techniques are correct, except in one instance, the component values although possibly suitable in the author's case are not optimum in either filter.

When designing high pass filters for attachment to the front end of TV sets, it must be remembered that all frequencies above 45 MHz must pass virtually unattenuated, particularly in fringe areas where channel 0 is received.

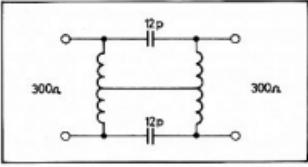


FIGURE 1A

In Fig. 1, L1 and L2 are 0.37 uH. The capacitors would probably be better to be a preferred value higher at 56 pF and 27 pF. In Fig. 2, L3 and L4 are 1.86 uH but should be 1.1 to 1.2 uH, preferably the latter. The capacitors should be 15 pF and not 12 pF. Particularly in the case of the 300 ohm filter a static leak resistor should be placed across each capacitor, otherwise high electrostatic voltages may be generated on aerials during electrical storms if no leakage path is provided from the aerial to earth. The capacitors could easily break down in these circumstances. The capacitors in all filters may be disc ceramic, preferably NPO, although N750 will do.

Whilst I agree with the author of the article regarding the use of the 1:1 RF transformers on 75 ohm lines, I believe from experience that this transformer is not required on the balanced 300 ohm line when the high pass filter is installed. The reason for this being that considerable opposition to the flow of HF currents is achieved by the series capacitors. There is no opposition to current flow on the braid of the coaxial cable and the transformer is needed in this case. The transformer should preferably be wound in a bifilar manner, for least losses. A static leak resistance should be connected between the primary and secondary of the transformer on the earthy end of each winding.

It is interesting to note that a well designed high pass filter attached to a television receiver has two functions (1)

to prevent HF transmissions from overloading the front end of the television receiver and other vulnerable parts, and (2) to reduce or eliminate the radiation of line output stages harmonic energy that can be the bane of the life of a 160, 80 or 40 metre operator when receiving on these bands. The filter stops HF energy coming down to the set and prevents HF going out through the aerial. To fully overcome this problem a mains filter may also be necessary. A filter for 300 ohm use as shown in Fig. 1a is unsuitable for attenuation of this signal, the filters in Figs. 2a, 2b and 2c are suitable. All coaxial filters must have a 1:1 braid breaking transformer fitted.

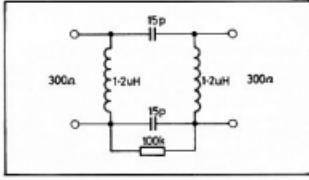


FIGURE 2A

One of the problems with filters such as shown in Fig. 2a is the fact that it has little attenuation in the frequency region 20 to 30 MHz where a television receiver is most sensitive. This filter in itself is quite adequate for filtering out HF transmissions up to 15 MHz but quite likely to be inadequate if an amateur runs high power on 28 MHz. At 28 MHz there is only about 14 dB of attenuation. The filter shown in Fig. 2b is much more effective in the region 15 to 30 MHz having not less than 36 dB over the whole range with a notch at approximately 28 MHz of 55 dB. The graph shows the relative attenuation of these two filters, and another simple filter, Fig. 2c, which may also prove useful. Many readers may not be aware that most solid state TV tuners have a composite filter fitted to the front end of them with traps tuned in the 30 to 40 MHz range for IF breakthrough protection, and an elementary high pass filter with 10 to 20 dB of attenuation below 30 MHz.

From experience it has not been found necessary to fit filters of a greater number of sections than that shown in Fig. 2b to television receivers. It is desirable to fit an extra section to the front end of masthead amplifiers as they are broad band devices with almost uniform response from 10 MHz to 1 GHz. The extra section brings the minimum attenuation below 30 MHz to at least 55 dB. It has also been found that the fittings of filters to the aerials of some sets produces no tangible improvement and interference patterning or complete

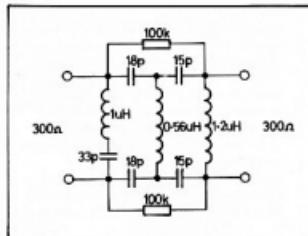


FIGURE 2B

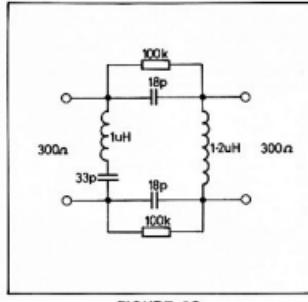


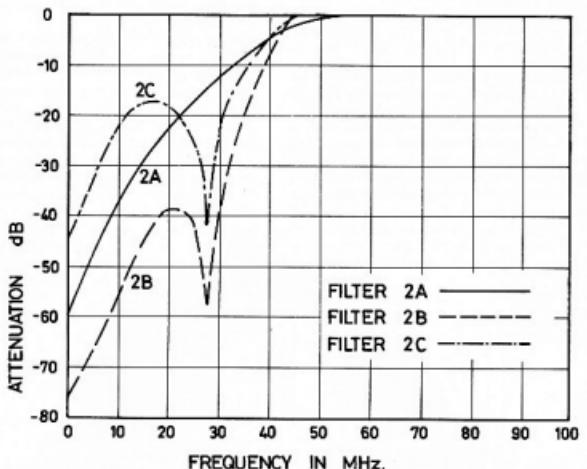
FIGURE 2C

blackout of the TV picture and sound can occur. One fairly popular colour set is quite prone to this trouble and a couple of black and white sets of around 5 years vintage are also troublesome. Research into the cure of these particular problems is being carried out, although results so far have been discouraging.

I have built a number of 300 ohm filters with good results, using commercially available inductors. They can be wound by hand, the formulae in the fundamental section of ARRL, "The Radio Amateur's Handbook", are accurate enough. Referring to the December 1977 article, if L1 and L2 are reduced by 1 turn and L3 and L4 are reduced by 4 turns and spread over the same winding length and with the capacitors as shown in this article, these filters should be quite satisfactory.

For further extremely good reading on interference I would suggest that you read chapter 17 of RSGB Edition 5 "Radio Communication Handbook", and "Radio Communication" March 1976 Technical Topics, page 207. The coaxial type high pass filters with the isolation transformer fitted are available from Onsite Antennas, 122 Wanda Street, Mulgrave, Victoria. To my knowledge these are the only commercially available filters with the transformer fitted as standard.

## FILTER ATTENUATION CHART



FILTER ATTENUATION CHARACTERISTICS AT 250 MHz  
IS WITHIN 2dB OF 100 MHz ATTENUATION

FIGURE 1B

With the use of a well designed low pass filter on your transmitter and well designed high pass filters fitted to good television receivers, operation on all HF bands with the legal limit and a beam should not cause interference. Do not back away from interference problems, it is a rare one that cannot be solved successfully.

Different choices of cut-off frequency and other filter constants will yield different component values. Rodney has made a different choice to that made by the other author. We agree that grounding is essential — for safety if for no other reason. — Ed.

## DESIGNATIONS OF AMATEUR BANDS WITHIN AUSTRALIA

160m	1800-1860 kHz
80m	3.5-3.7 MHz
40m	7.0-7.15 MHz
20m	14.0-14.35 MHz
15m	21.0-21.45 MHz
10m	28.0-29.7 MHz
6m	52.54 MHz
2m	144-148 MHz
70cm	420-450 MHz
23cm	1215-1300 MHz
12cm	2300-2450 MHz
9cm	3.3-3.5 GHz
5cm	5.65-5.85 GHz
3cm	10-10.5 GHz

## RADIO AMATEURS OLD TIMERS' CLUB

Bob Cunningham VK3ML advises that the annual dinner for the RAOTC (Radio Amateurs Old Timers' Club) will be held in 1979 at the usual venue, Science House, Clunes Rose Building, Parkdale, Melbourne, on Thursday, 8 March. The guest speaker on this occasion will be Ray Naughton VK3ATN, who will speak on Radio Astronomy. Ray is well known, of course, for his original work on Moon Bouncing techniques. It is expected that more than 100 members will attend that year.

Membership of the RAOTC is now some 250 from all States of Australia as well as overseas.

The qualification for membership of the Club, open to Amateurs world-wide, is to have held an Amateur Licence (or equivalent) for at least 25 years. There is no subscription to the Club but a charge of \$2 is made for the attractive certificate of membership, plus postage.

Application to join the Club can be made by writing to Harry Cliff VK3HC, PO Box 50, Point Lonsdale, Victoria 3225, accompanied by a SEA envelope.

Technical Articles  
Always Needed

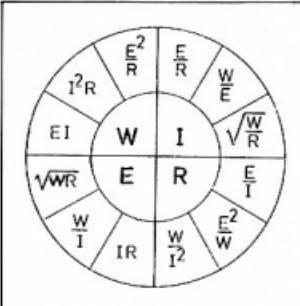
## AMPS, OHMS AND VOLTS

Most of us have a fairly clear idea of what volts, ohms and amps are. We can get a good picture by thinking of them in terms of water. The electrical voltage is similar to water pressure which forces the water through pipes in the same way that the electrical pressure forces the electrons through a conductor. The constricted area of the pipes tends to slow down the flow of water and in the same way the resistance in an electrical circuit slows down the flow of electrons. Finally the amount of current flowing in the electrical circuit can be related to the amount of water in litres per minute flowing in the water pipe.

But where people often run into difficulty is when they try to make use of the formulae which connect these three things together. Most can remember that the current  $I$  equals the voltage  $V$  divided by the resistance  $R$  but after that we can get confused. And for those who are not used to algebra it is not an easy thing to transform one formula into another. A further complication comes when we are trying to consider the power in watts developed in the circuit. The basic idea of power can also be related to water. If we think a moment it is clear that the greater the flow of water the more power there will be — if the pressure remains the same. If the pressure also increases there will be still more power. So the total power is equal to the pressure and the flow multiplied together and exactly the same thing happens with the electrical circuit. The power in watts is equal to the current  $I$  multiplied by the pressure of voltage  $V$ .

In order to save the trouble of trying to remember all the combinations of these formulae we can refer to the chart below. Inside the inner circle is the parameter we want to get, and on the outside in the three minor segments are the three different combinations of current, power, voltage or resistance which will give the answer. There are a total of twelve relationships in all.

From Zero Beat, June 1978.



# A SIMPLE AND ECONOMICAL SSB 80 METRE RECEIVER

Roy Hartkopf VK3AOH

34 Toolangi Road, Alphington, Vic. 3078

The following article will describe two modules which can be made up into a simple but surprisingly useful little receiver which is capable of receiving single sideband stations as well as Morse, and the normal amplitude modulated stations. It works on the principle of direct conversion, or zero beat.

## INTRODUCTION

As you know, radio waves are individually identified because they are at a particular frequency. If these waves are modulated by speech or music there appear what are called sidebands, waves with frequencies slightly higher and lower than the centre carrier frequency. Now if we have a second carrier at exactly the same frequency as the first we find this carrier will beat with the sidebands and give an audible tone. If the two carriers are at a slightly different frequency they will also produce a beat note and this is the whistle — often called a heterodyne whistle — which you can hear sometimes when tuning in to a station.

The very old fashioned radios had a very typical whistle which was caused by this effect, and when they were tuned the whistle would start at a very high pitch and then get lower and lower gradually until it came down to nothing, that is, zero beat. Modern single sideband receivers do exactly the same thing.

So basically there are three parts to our receiver. There is the detector which detects the incoming signal and also the local frequency and beats them together. There is the local oscillator, which generates the beat frequency, and finally there is the audio amplifier section which amplifies the signal so that it can be heard through a loudspeaker.

## AUDIO SECTION

The audio amplifier is constructed as a separate unit as it has many applications and can be a most useful little device to have around the shack. If you have never built anything before this is an ideal project to start on, and if you have not got one in your shack you are missing out on a most useful gadget.

What can an audio amplifier be used for? First of all it can be used as a signal tracer. If you have a radio or amplifier which is not working you can attach a probe to the input of your amplifier and touch on to various parts of the amplifier or receiver until you find a signal. This will enable you to locate where the trouble is.

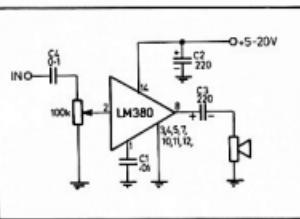


FIG. 4: Audio Circuit Diagram.

If for example the loudspeaker is burnt out you will get a signal through the signal tracer as soon as you touch the leads on to the output of the transformer, if there is one which feeds the speaker.

The if you put a diode in the input to the amplifier you will be able to check the radio frequency sections of a receiver. Then, with an audio oscillator you can use it as a Morse code practice set.

If you make a simple bridge you can use it as a detector for checking the value of capacitors and resistors and inductors.

A microphone on the input and you can use it as a lower power "public address" amplifier. If you put long leads on to the speaker it can act as an intercom or a baby alarm.

It is possible to make an amplifier using a couple of transistors and various components, but by far the simplest method nowadays is to use an integrated circuit. The National LM380 is an ideal device for this kind of job. It will work with a voltage of anything between about 5 and 20 volts and requires only about three external components to make it into a robust workable amplifier. Fig. 1 shows the circuit of the amplifier and you can see that it is very simple indeed.

Fig. 2 shows the layout of the copper side of the board and Fig. 3 shows the component layout. As long as you are careful not to put the integrated circuit or the electrolytic capacitors on the board back to front, or to connect the battery the wrong way there is nothing that can go wrong.

Be very careful to mount the LM380

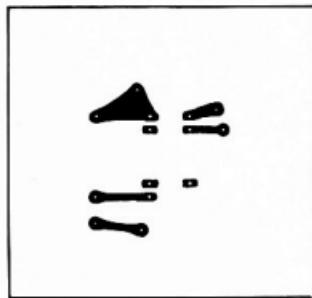


FIG. 2: Audio Board (exact size).

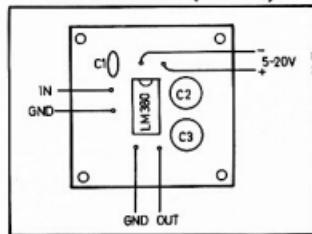


FIG. 3: LM380 mounting position and component layout.

with the nick or dot at the end as shown in Fig. 3.

You can use any small speaker with 8 or 16 ohm impedance or even a 3 ohm speaker will do if the LM380 is not driven too hard. The speaker, battery and circuit board should be mounted in a simple box so that it can be easily carried and will not be damaged.

For those who have already got a lot of goodies in their junk box, is the suggestion that an equally suitable audio amplifier could be made simply by taking the audio section of an old transistor radio and mounting it together with a battery and a speaker in a box. If you have any discarded transistor radios this method will give the same results without costing a cent.

### 3.5 MHz RECEIVER

The normal mode of transmission nowadays in the voice HF band is single sideband with suppressed carrier. Our receiver has an oscillator which beats with the received sideband and so creates the audio frequency signals. When it is picking up CW (Morse), the two carriers beat together and in the same way produce an audio frequency signal, so the receiver is good for Morse as well as for single sideband. The pitch of the note or whistle can be changed by varying the frequency of the local oscillator.

The circuit of the direct conversion receiver is shown in Fig. 4, and it can be seen that it is not very complicated. The oscillator uses a BC108 or similar transistor and almost any silicon NPN transistor can be used. This oscillator is designed to work from about 3.4 to 3.8

MHz. The Australian Amateur band is 3.5 to 3.7 MHz.

The tuned circuit of the oscillator is between base and ground and the feedback is supplied to the emitter to cause the Transistor to oscillate. The output is taken to one of the gates of a dual gate FET, a 3N210. If it is available, the older type MPF121 is quite suitable and should not require any alteration to the circuit.

The other gate of the dual gate FET is fed from the tuned circuit which picks up the signal, and thus the signal and oscillator frequencies are mixed, and the audio beat note appears in the drain or output of the FET. Here it goes into a small audio transformer, and the output of this audio transformer is taken to the audio amplifier described in the audio section above.

Fig. 5 shows the component layout and Fig. 6 is a full size layout of the circuit board. It can be seen that the variable capacitors for tuning the signal and the oscillator are separate. It would have been possible to gang them together and have only one tuning control but this would create lining up difficulties. It is quite a simple matter in practice to tune the oscillator until a signal is heard, and then to peak it up by adjusting the signal tuning capacitor.

Considering the simplicity of the receiver it is quite sensitive, but it does need a good antenna, an 80 metre dipole is ideal, for the best results. The receiver also has a tendency to overloading when there is a very strong local signal, but as a means of getting started when you have not got anything which will resolve single side-band it is probably the best type of circuit available.

For those who intend using it as something more than a simple experimental project, it is suggested that the oscillator capacitor at least be removed from the rather limited space on the circuit board. It should be fitted with a large control knob which would make tuning less difficult. The tuning in of sideband stations can be quite critical and care is needed to make the signal readable.

Adapted from Zero Beat.

## EDITOR'S NOTE:

This project is designed basically for self teaching purposes. The author has committed later that it is necessary for a well regulated 9V power supply to be used.

The audio section works well but some modifications have been made to the original design. It is hoped to publish the modifications at a later date.

In the meantime, due to the simplicity and economic viability of the receiver, we recommend to newcomers to have a go at it, and learn as your progress. ■

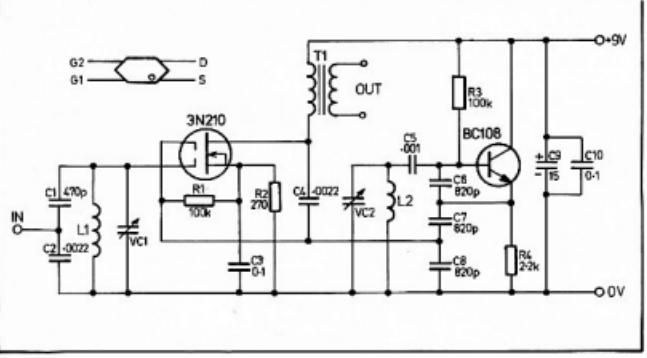
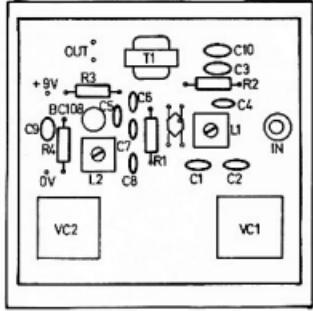


FIG. 4: 3.5 MHz Front End Circuit Diagram.

L1 & L2 — app. 30 turns on small Japanese type former or Neosid 722 former, F16 slug.

VC1 & VC2 — salvaged BC type 450 pF capacitors or similar.



**FIGURE 5:**

## Component layout (front end).



**FIGURE 6:**  
**Front End**  
**Board**  
**(exact size)**  
**Copper side.**

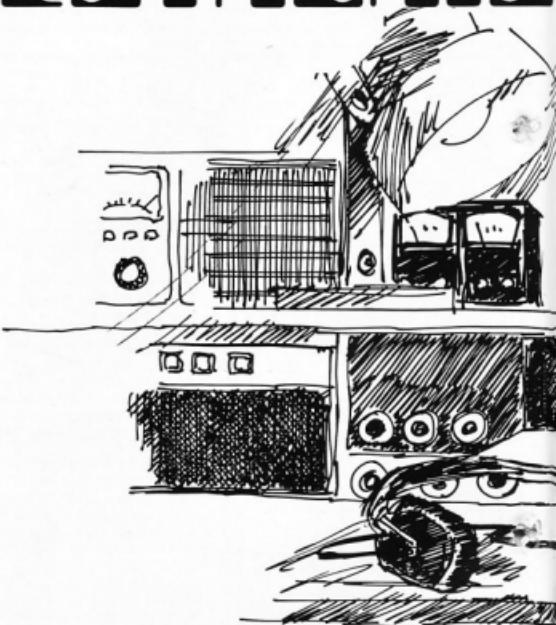
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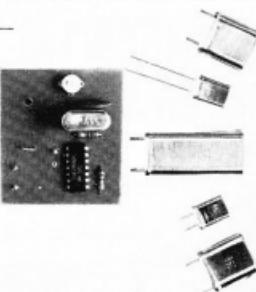
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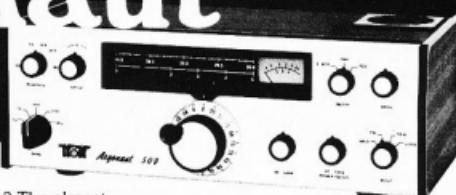
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# VK/CB ACTIVITIES

Sam Voron VK2BVS

Instead of a dull, boring old AGM the members of the Amateur and Citizens Radio (VKCB) Club decided to put on a big display prior to and after its annual general meeting.

The AGM only lasted an hour and then it was back to showing the general public the fascinating worlds of radio.

Local articles in the press and announcements over radio attracted many of the folks from around Sydney who sat on the Club's AGM and participated in the Club's display, disposal table and information centres.

**Photo No. 1:** The dedication and work of Max Lowe in promoting CB and Amateur Radio in NSW recognised by Club members.

Max Lowe, Deputy Director of the NCRA in NSW and President of the four-wheel

drive radio club, demonstrates the setting up of a portable field station. You will notice the tent, generator and portable rig, plus antenna, being assembled. Max was unanimously elected as the Club's Vice-President at the AGM. Max has been studying the morse, theory and reg's., and signed himself up for the November Novice exam. He is quite confident he will get it, but until then he has taken up his new hobby of SWLing on 160 through to 10m.

The VKCB Club has been encouraging joint ventures with CB groups around the State as a means of promoting good CB usage as well as introducing the spirit and aims which encompass the hobby of amateur radio. Max and the four-wheel drive club members have been particularly enthusiastic in supporting the VKCB concept of promoting both CB and amateur

activities since the Club was formed a year ago.

**Photo No. 2:** The promotion of WIA membership can only serve to strengthen Amateur Radio.

As in all the Club's activities, WIA publications, information sheets and membership forms are made available to the public on displays such as these.

**Photo No. 3:** Alan Cox VK2NYC, one of our newly licensed Club members in action. Whilst still studying for his licence, Alan assisted in the development of the Club right from the start, particularly as the Eastern Suburbs Co-ordinator and former Secretary of the Club. Alan's new position is that of Club magazine editor for "Amacit", denoting the two areas of involvement of the Club. Here you see Alan using his new FT7 transceiver.



PHOTO No. 1



PHOTO No. 2



PHOTO No. 3



PHOTO No. 4

**Photo No. 4: The medium and high frequency radio display.**

A world map, field day photos, a chart of the bands and what happens on them and, of course, the gear make up quite a nice display.

**Photo No. 5: Simeon Cran VK2YFZ/2NIC at the VHF, UHF, SHF display.**

Another fellow who has been involved with the Club right from its formation a year ago is Simeon; he has been quite active in a variety of ways in encouraging and helping the newcomer. Pictured you see Simeon's 2m FM rig and his 6m FM, SSB, AM, CW transceiver. ■

**PHOTO No. 5**



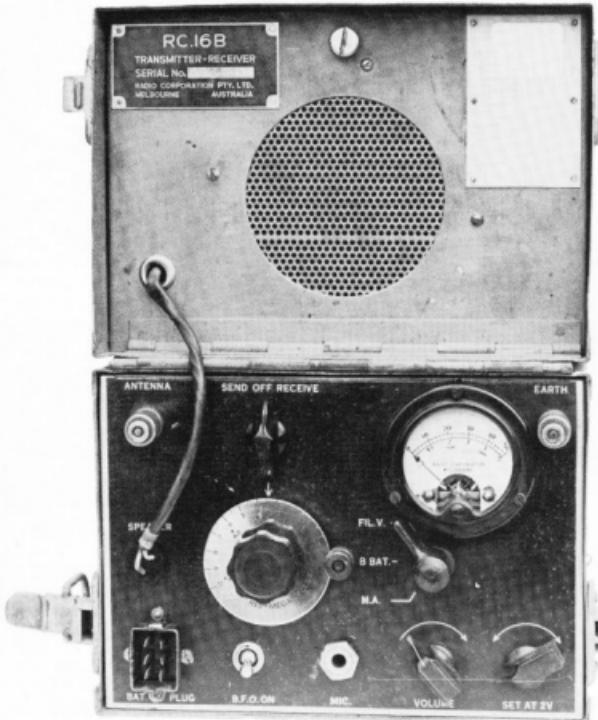
## **PORTABLE ARMY WIRELESS SETS OF WORLD WAR II**

Compiled by R. Champness VK3UG

5. The Wireless Set No. 22T is a British designed and built portable AM/CW transceiver for the 2 to 8 MHz range, with both transmitter and receiver being VFO controlled. The transmitter is grid modulated in the AM mode. It has three EL32 valves in the final stage, the Australian version of the same set uses one 807. The output power on CW is estimated to be between 8 and 12 watts. The set operates from a single vibrator supply from a 12 volt accumulator.

A complete station, including the set, accumulator and aerial systems, could be packed on the backs of three men, certainly not a light load. These were one of the first sets to use semi-break-in keying on CW.

The English No. 22 set set the pattern for the Australian No. 22 yellow band series, which is similar in concept but uses the valves more commonly available in Australia at that time. Subsequently the yellow band set gave way to the Australian designed No. 22 and probably the ultimate in its class, the No. 122. The British set is not a particularly marvellous set in my opinion, and it was ultimately superseded by the No. 62 set, a robust and probably



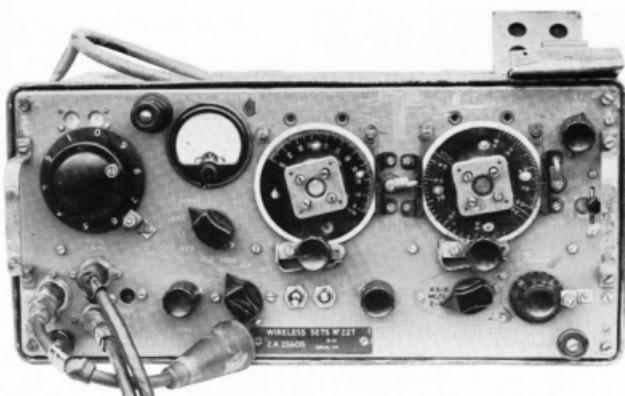


PHOTO 5 — Wireless Set No. 22T.

reliable set, although it, too, had many deficiencies.

6. The RC16B was known under several different titles, depending on whether it was being used by the army or air force. There are two versions of this transceiver,

one having one xtal locked transmission frequency and the later model had two. The transmitter and receiver are both capable of operating on AM and CW. The receive is tuneable between 3 and 7 MHz. The set is designed to work off dry

batteries, which have to supply 3 volts, 135 volts, 80 volts, and 4.5 and 7.5 volts of bias. The set uses 2 volt valves which were designed to use with 2 volt accumulators. The filament drain on receive is .58 amps and a whopping 0.78 amps on transmit. On the HT side the drain on receive is 16 mA and on transmit about 50 mA. The dry batteries to run such a set for any length of time would be monstrous in size and heavy. Not my idea of a portable set. This is one of the few sets where a loudspeaker is standard equipment.

The receiver performs quite well, is fairly sensitive and smooth to operate. The transmitter oscillator is not an eager starter and needs to be tuned carefully for reliable oscillation. The transmitter puts out between 2 and 2½ watts, and is plate modulated by a class B modulator, which is most unusual in a dry battery operated set. Radio Corporation used class B modulators to provide high level modulation in many of their sets. Many of these sets were used by the Forests Commission of Victoria until better sets became available. I don't think that amateurs would have used these sets because of the high current drain and low output power. Completely converted to 6 volt valves and run from 240 volts they could have done a reasonable job for amateurs. ■

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# NOVICE NOTES

## MEASURING RF LOSS IN COAXIAL LINES

The efficiency of your coaxial lines may be determined by measuring the line loss at your operating frequency. You can do this by merely short-circuiting the far end of your coaxial line and measuring the standing-wave ratio with your SWR meter. If there is no line loss whatsoever, the SWR reading will be infinite (full scale), indicating that the reflected wave is equal in amplitude (size) to the incident wave. In a real-life situation, of course, this is not the case, and the SWR reading under the test condition will be less than infinite, due to line loss.

In order to make this measurement, the antenna termination is removed from the far end of the transmission line and the outer shield is firmly shorted, a really short short, to the inner conductor of the line. A small amount of power at the required frequency is applied to the line through the SWR meter. The meter is adjusted for full scale reading on the "forward" position, and the meter switch is then thrown to the "reverse" position. The line loss may then be computed from the reverse reading and the chart in Fig. 1.

If, for example, the SWR turns out to be 4.5, the cable loss (attenuation) is 2 decibels. This means that your coaxial line is about 63 per cent efficient, and that 37 per

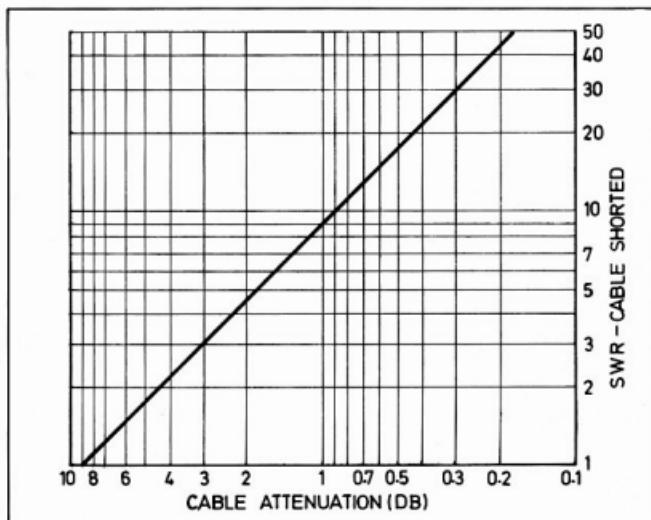


FIGURE 1

cent of your transmitter output power is being lost in the line. If the SWR reading, on the other hand, is 9, then your line loss is

only 1 decibel and your line is about 80 per cent efficient.

From "The Lyrebird", Winter 1978. ■

## NOT SO YOUNG!!

Harry D. Alderson VK2NSR  
P.O. Box 1084, Coffs Harbour, N.S.W. 2450

One tends to regard the Novice as a young man — often a schoolboy. So here is a new breed of Novice operators appearing on the scene. The ex-serviceman now retired but an ex-World War II operator making a comeback, often slow and painful.

Harry is in his 60s, an ex RAAF Wireless Telegraphist with over five years experience as an operator in aircraft, ship's operator, but mainly ground installations in the south-west Pacific area, and was discharged from the RAAF in 1946.

He resumed his peace time occupation as a steam and electric locomotive driver with the Victorian Railways for more than 30 years.

Equipment in use is a modified TS520S into a half wave dipole 50 feet high running north-east and south-west.

He became operational 23-7-78 on the 80 metre band, CW only, and has worked all Australian States, New Zealand and into Irianjaya (Java).

Harry qualified for the Novice licence in Melbourne, October 1977, and expresses



Harry Alderson VK2NSR.

thanks to the patient coaching from the WIA Novice class instructor, Miss Norma Boyle VK3AYL.

He would like to comment on the help

given by full call amateurs who are always on hand to assist the newcomer.

Harry hopes to work 10 and 15 metre bands later this year — CW only. ■

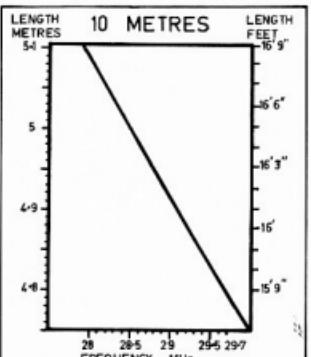
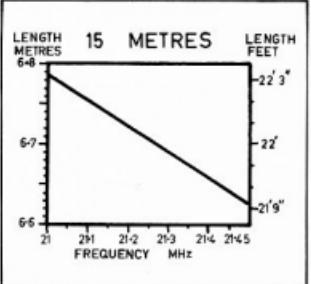
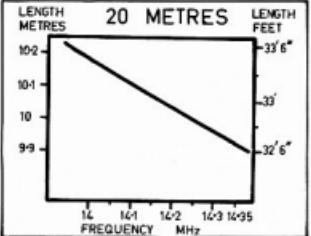
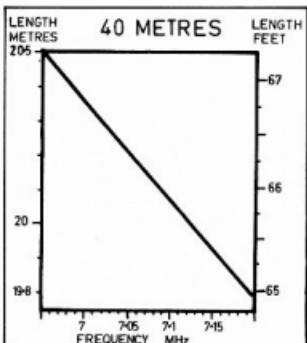
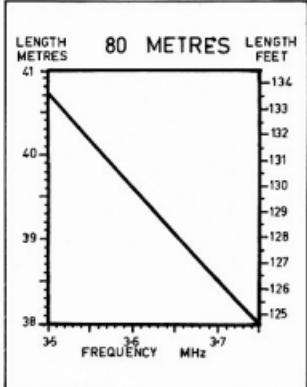
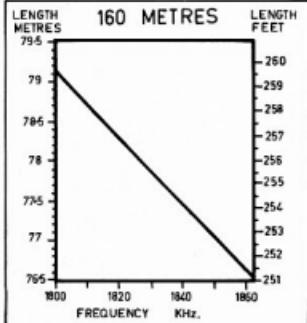
## WIRE HALF WAVE DIPOLE AERIAL LENGTHS

The following charts of half wave dipole lengths are based on the theoretical half wave length shortened by 5 per cent to allow for wire thickness and end effects. If the aerial is close to the ground or other objects some further pruning may be necessary. This will be the case if an inverted Vee or sloping dipole configuration

is used or if the antenna is surrounded by trees.

The wire size envisaged is between 16 gauge and 10 gauge and this would include the common copper earth wire type of 7/0.029.

When erected the dipole should be checked for feed impedance or SWR in the band. The antenna length should then be adjusted to give a symmetrical SWR curve in the band. This SWR curve may be obtained by plotting SWR for various frequencies in the band. A similar result may be obtained by plotting feed impedance using a noise bridge or an antenna scope. The use of a noise bridge or an antenna scope will result in least interference to other band users as a signal does not have to be radiated and is preferred.



## AUDIO BLANKER

Here is a circuit that will work well in receivers that do not have a narrow filter.

This simple audio-stage noise blanker will reject most repetitive, pulse-type interference, like radar and automobile ignition spikes, that often plagues AM receivers. The circuit is both less costly and far less complex than the radio-frequency stage blankers employed in some of the more sophisticated receivers, and though not as effective in eliminating interference, it outperforms the more commonly used noise-limiting audio-clipping circuits.

The blanker shown in the figure detects whether the amplitude of an offending pulse train at the output of the receiver's envelope detector exceeds a set threshold and then disables the output stage if necessary. Waveform diagrams are shown at several circuit points to help clarify operation of the blanker.

A typical amplitude-modulated signal might appear at the input of an AM receiver as shown in the upper left of the figure, where a 20-megahertz radio-frequency wave, modulated 30 per cent, is overridden by radar pulses 20 decibels greater in amplitude. A time-magnified portion of the AM detector output, after passing through an inverting operational-amplifier stage, would appear as shown, where the maximum amplitude of the pulse would be limited by the saturating level of the intermediate-frequency amplifier. Only two offending pulses are shown for clarity, but this detected signal contains a pulse train of sufficient amplitude and repetition rate to generate a substantial pulse noise and so impair the readability of the signal.

The interfering spikes increase the effective modulation percentage to well over 100 per cent. The blanker is triggered into operation when the modulation peak exceeds 140 per cent, whereupon  $Q_1$  and  $Q_2$  switch on and disable signal-gate  $Q_3$  for the duration of each spike. The 140 per cent threshold has been experimentally determined as the point at which the interference caused by the blanking operation itself is still less than the interference generated by the offending pulse train. Note that to ensure that the blanking action occurs at the set modulation peak independently of signal-level changes, the receiver's automatic-gain-control signal is introduced at the threshold bias point at the emitter of  $Q_1$ .

$Q_3$  operates with no applied DC voltage so that no switching transients will be generated by the blanking action to impair circuit performance.  $Q_1$ ,  $R_1$ , and  $C_1$  have a fast-attack, slow-decay characteristic.  $Q_3$  is thus gently turned on after a spike has passed so that the popping and clicking sounds that often accompany the operation of a blanking circuit that processes a randomly occurring train of spikes will be further suppressed.

The results of the blanking action are shown at the output of  $Q_3$ , where it is seen

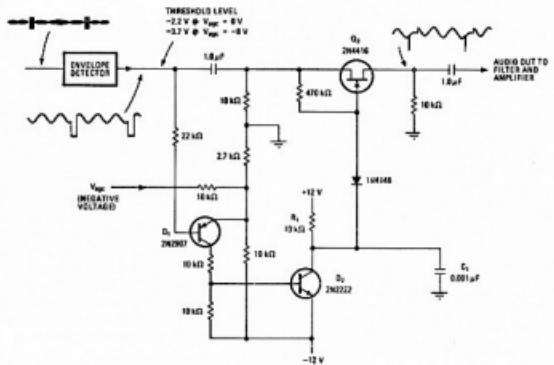


FIG. 1: Spike Eater. Audio-stage noise blanker, although not as effective at eliminating pulse-type interference as RF-stage blankers, out-performs noise limiter/clipper circuits.

that only brief transients appear. The signal is slightly distorted, but the distortion is barely audible. There is a great im-

provement in noise reduction, however.

Reproduced from Electronics, July 6th, 1978. ■

## IS AMATEUR RADIO NECESSARY?

Remember the EEB a few years ago? The following item appeared in their February 1973 issue, and was reproduced in AR of April 1973.

We are reprinting the article again for the benefit of our newer members as the message contained therein is very relevant in today's climate.

Read this article twice, then take some action for your own hobby's sake.

A: Have another beer.

B: Don't mind if I do.

A: What are your thoughts on Repeaters?

B: All in favour of them. You fellows are squeezing into less and less space.

A: Well that's good isn't it? We're using the bands more efficiently.

B: Yes it certainly is good. There are a lot of other chaps who want that space, and it looks as though they ought to have it.

A: Oh?

B: You realise, say, that 80 metres is ideal for people doing work in the outback?

A: But why 80m? Why not 81m?

B: All right but they want 80m, and the equipment is already commercially available.

A: But we have already got plenty of amateurs on 80; just listen to the QRM any week-end.

B: But how dead is it during the week? And what is to prevent you from doing all your operating with VHF repeaters? You could get nearly as much DX from a chain of repeaters as you get from 80 metres.

A: But that's not fair! A lot of blokes prefer to build HF equipment which is less critical of components and adjustments than is VHF gear.

B: Oh yes, and how many people do build their own any more?

A: Plenty; the amateur magazines are full of constructional articles.

B: Do you build?

A: Well no, but that's a special case; I've just got too much to do for the wife and my job.

B: It's not so special; when more people were constructing they were just as busy. But let's return to the original point. You chaps have already lost a large slice of 80 to commercials who do in fact use it constructively. You can hardly assert that most of amateur operation is constructive nowadays. Furthermore repeaters show that you can operate on much less space than

you have been given. Why, for instance, should you have 4 MHz on 2 metres when in fact you produce the most activity there from FM contacts using some 3 MHz largely unoccupied.

A: But the low end is certainly occupied very heavily by SSB, etc.

B: Sure, some 200-300 kHz worth; that's heavy?

A: We have to plan for the future; more amateurs will need more frequencies.

B: The present channel spacing could be reduced, and more amateurs could be put into each band segment.

A: This would turn amateur operation into one great net.

B: Isn't that the direction its going now?

A: How about individualists who don't want to be crowded in with the others?

B: Let's keep our priorities in mind. The important thing is not what amateurs want but what societies need.

A: I suppose that society "needs" space in 40 and 80m while there is ample space available to them outside of our bands?

B: There is such space, but you must admit that the propaganda stations find a hand-picked audience already at hand in the amateur bands.

A: Amateurs are not interested in propaganda!

B: Then why don't more of them jam the broadcasts of the intruders? Only a tiny signal sitting one of their frequencies can cause havoc.

A: Amateurs have more important things to do. The fact remains that the intruders have no business being there; are you supporting their propaganda activity?

B: Certainly not. Arguments have in fact been advanced in favour of your having more space in 40m, but this was opposed by the government of Infrabovia — with whom we are presumably on friendly terms. What more can be done?

A: At least we shouldn't lose the frequencies to which we are entitled.

B: Are you entitled to them?

A: Yes, we were given these frequencies by international agreement.

B: Modern tendencies toward band-sharing show that this agreement is no longer as valid.

A: But that's not fair!

B: So? What have amateurs done in recent times to justify their use of the bands?

A: Training new technical talent?

B: That's taken care of nicely by commercial and military training programmes.

A: Civil defence?

B: This is already handled very competently by governmental agencies.

A: Message handling?

B: Not significantly outside of North America, and look at the mess it has become over there. They are even phone patching commercial transactions now!

A: At least amateur radio provides a healthy hobby for a large number of people.

B: Have you listened to the bands recently?

A: Of course.

B: Do you call "healthy" the kind of courtesy, bad operating and incompetent operating heard there?

A: That's only a noisy minority.

B: You can't convince the public of that.

A: (Smugly) Most of our operation is on SSB and the public can't receive that, so they don't matter.

B: The commercials can, and they do matter. And they want your frequencies. You have shown that with the aid of repeaters you can do with far smaller bands. You have shown by scanty use you need far fewer bands. And you have shown by incompetence and poor operating that you are jolly lucky to have any frequencies at all.

A: If you destroy radio you'll be destroying a large commercial enterprise.

B: Who's destroying radio? Only amateur radio; there is much commercial and service opportunity in other directions. Already component manufacturers are recognising this by largely ignoring amateur complaints about component scarcity. The big production goes where the big money is: in the entertainment and commercial communications markets.

A: (Gasp) I need another beer.

B: Me too. May I make a suggestion I hope you'll pass on to your mates. You'll have a better chance of keeping the bands if the intelligent majority accepts some responsibility for pulling the Clods back into line. This requires the individual responsibility, and that means you and your friends. If you do nothing, you'll get nothing.

## WOOLEY BUM CERTIFICATE OF ACHIEVEMENT AWARD

Alan Greening VK3WU has advised us of the formation of the "Wooley Bum" Club.

The Club consists of ex 27 MHz "Bootleg" operators who approached Alan for information on upgrading to amateur radio.

Alan has conducted Novice courses for these people and to date over 90 ex pirates have obtained their Novice licences and settled down to enjoy the benefits of amateur radio operation.



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### The Wooley Bum Charter Certificate of Achievement Award IN AMATEUR RADIO



FOR A TWO WAY RADIO CONTACT WITH THE  
WOOLEY BUM CLUB OF MELBOURNE AUSTRALIA

STATION VK3WU  
WB NOVICE CLASSES  
DATED THE EIGHT DAY OF AUGUST 19 78



IS ENTITLED TO ALL THE PRIVILEGES, FAVOURS, GLORY,  
NOTORIETY, FAME, RANK, RIGHTS, POPULARITY, AND  
HONOUR OF MEMBERSHIP TO THIS CLUB ETC., ETC.

IN TESTIMONY WHEREOF WE HAVE CAUSED  
THIS CERTIFICATE TO BE SEALED WITH  
THE SEAL OF THE PRESIDENT OF THE SAID CLUB.



THE  
BIG  
EX  
10 - 4  
NET



DAVID RAMSBOTTOM

PRESIDENT



Alan is to be congratulated on his efforts and we trust that only good can come from the acquisition of these Novices.

The Club conducts their rag chew net each Sunday on 28.570 MHz ± QRM at 10.00 hrs. EAST (2400Z and 0100Z during local daylight saving time).

To gain membership to the Club, 10 points are required to qualify. Points are obtained as follows:-

QSOs with cert. holder No. 1, 10 points;  
QSOs with cert. holders Nos. 2-49, 3 points;  
QSOs with cert. holders Nos. 50-99, 2 points;  
QSOs with cert. holders Nos. 100 up, 1 point.

Send details of your QSOs to:-

Awards Manager,  
David Ramsbottom,  
PO Box 212,  
Prahran, Vic 3181.

Plus membership certificate issuing fee of A\$3.00 (to cover printing costs and air-mail world-wide).

Further information may be obtained from —

Alan Greening VK3WU,  
PO Box 180,  
Glenroy, Vic. 3046  
Ph. (03) 42 1616 (bus. hrs.).

#### EDITOR'S NOTE:

Whilst some of our members may have some reservations regarding the activities, and particularly the "name" of the above Club, we nevertheless recognise that any attempt to educate CBers in upgrading to amateur radio through the normal legal processes deserves credit.

We therefore make no apologies for the publication of this item and look forward to further contributions/articles in this area.

Please avoid late  
Subscription  
Payments

# WIA MEMBERSHIP

As you know the WIA is made up of seven Divisions plus the Federal body.

Only the seven Divisions are members of the Federal WIA, nobody else.

Individual persons are members of a Division — normally the WIA Division of the State in which they live.

The Federal WIA keeps central EDP records on behalf of the Divisions. The Federal body also collects and processes individuals' subscriptions on behalf of Divisions. The Federal organisation has an office in Toorak, Victoria, but is not a part of the Victorian Division any more than it is a part of any other Division. The Federal body publishes AR on behalf of the WIA as a whole, it represents amateur radio both nationally and internationally and carries out some other services on behalf of members (e.g. Magpubs).

But you, as a member, in general look to your Division for your requirements. The Division appoints members, is responsible for membership gradings and deals with enquiries from its members. The Division also handles all local (i.e. State) affairs, representations to State Radio Branches, dealings with local WIA (and other) Clubs and Zones, QSL bureau and many other functions.

It serves no purpose writing to the Federal WIA about any of these things because your enquiry will only be sent forward to your Division and delays can occur. As a general practice the Divisions do not have the services of paid staff. Divisional work is done by the volunteers you have appointed to your Divisional Council.

Each Division is a separately registered company under the Companies Act and has its own constitution. The Federal WIA is also a separate company with its own Memorandum and Articles of Association. Since the whole is the WIA, there is an enormous amount of liaison between the separate organisations. This is exemplified, for example, in the annual Federal Convention.

These brief explanations are designed to show you how the WIA operates and why you have to take up with your Division any membership and other questions which arise.

For very practical reasons, however, corners have to be cut so that work is not delayed for unimportant reasons. As one example, if you were a student last year, but not this year, and hence pay to Federal office the full subscription rate for this year, instead of the previous concessional rate, you will be re-graded upwards (upwards in terms of subscription rate) automatically. But if any re-grading would necessitate payment of a lower rate, the Federal office cannot re-grade you. This has to go back to the Division.

Again, each Division has its own definition of what a pensioner is, or what criteria qualifies a person to be a student. The same principle applies when Divisions appoint honorary life members, although there is a common denomination — service to the Division.

At the 1978 Federal Convention the Queensland Division brought forward an Agenda item to obtain agreement on the qualifications which appeared desirable before any member could be appointed an honorary life member of the Division. In the event the Agenda item was withdrawn after considerable discussion.

It is interesting, however, that Divisional Councils do make a very careful value judgement before appointing anyone to life membership. This is a step not taken lightly, if for no other reason than financial. The Division has to pay for its life members — for example, the Federal element of annual subscriptions, for a start.

How then, you could be forgiven for asking, does the Institute honour anybody who puts in outstanding work in the Federal sphere — as an outstanding member of the Executive or one of the specialist Executive Sub-Committees. This is achieved only by agreement between the Executive and the Division concerned, because only the Division has the power to appoint or re-grade its members. When agreement is reached, all the costs of such a life member are borne by the Executive. As such a person worked hard for the WIA as a whole, the WIA as a whole (i.e. the Federal body, namely the Executive) pays for him.

For services in the Federal sphere we find a number of well known amateurs are

life members of the Division, but paid for by the Executive:—

Horrle Young VK3AYH (now VK2), Bill Gronow VK3WG, George Hannan —, Ron Higginbotham VK3RN, Max Howden VK3BQ, Max Hull VK3ZS, Ray Jones VK3RJ, Michael Owen VK3KI, Ken Plincton VK3AFJ.

There is one life member in the ACT Division taken over from VK2:—

Arch Cox VK1GU.

The NSW Division has honoured 12 to life membership:—

Ces Bardwell VK2IR, Major Collett VK2RU, Dave Duff VK2EO, Alan Fairhall VK2KB, Bill Hall VK2XT, Pearce Healy VK2APQ, Keith Howard VK2AKX, Mrs. McKenzie —, Bill Moore VK2HZ, Bill Otto VK2ZL, R. H. F. Power —, Lionel Swain VK2CS.

In the Victorian Division there are seven

Bob Anderson VK3WY, Reg Busch VK3LS, John Lancaster VK3JL, Cliff Pickering VK3ATP, Herb Stevens VK3JO, Jim Stewart VK3AS, Peter Williams VK3IZ.

The Queensland Division have four:—

Peter Brown VK4PJ, L. J. Feenaghy —, Arthur Walz VK4AW, Norm Wilson VK4NP.

There are five in South Australia:—

Brian Austin VK5CA, V. R. P. Cook VK5AC, George Luxon VK5RX, Geoff Taylor VK5TY.

Western Australia also has five:—

Ron Hugo VK6KW, George Moss VK6GM, John Park VK6BB, Neil Penfold VK6NE, Jim Rumble VK6RU.

Tasmania has honoured five:—

Tom Allen VK7AL, Jack Batchler VK7JB, Jon Brown VK7BJ, Terry Connor VK7CT, Shirley Harrison VK7CH.

A grand total of 47 on the records. Unfortunately space does not permit listing all those who have passed on, although there were many. All these worthy amateurs, many of whom still work voluntarily for the Institute, have done their share towards making amateur radio what it is today. The amateur radio of tomorrow is what we make of it today. ■

## AMATEUR EXAMINATIONS — UK

The following is an extract from a short report in Short Wave Magazine for April '78 and will be of interest to instructors —

"From 1979 the Radio Amateur's Examination will be in the form of objective tests containing multiple-choice questions, and anyone preparing alone for his or her amateur licence and living in the London area, may be able to assist the City and Guilds of London Institute.

"In preparation for this change the Institute is to prepare objective questions, trying them out on candidates who have reached examination standard. Preliminary tests are intended to test the performance of individual questions and syllabus coverage. Infor-

mation is obtained which assists the Institute's reviewing panels in judging whether each individual question should be included in the question bank for use in future examinations."

## USA BAN ON LINEARS

Ham Radio April '78 reports the banning by FCC of the commercial manufacture, distribution and sale of any RF power amplifier covering the 24 to 35 MHz range. Amplifier sales between individual amateurs are still permitted to build their own 10-metre linears. Also there will be a set of type acceptance requirements on amateur amplifiers below 144 MHz. All these are to become effective, subject to challenges, from dates to be specified. ■



YAESU

baile

ADVANCED  
AMATEUR  
COMMUNICATION  
EQUIPMENT

FROM A WORLD  
LEADER —

**YAESU**  
FT-901 De-Luxe HF transceiver



FT-901DM DE-LUXE SSB, CW, AM, FSK, FM, HF TRANS-  
CEIVER, 160-10m, P.A. 2X6146B, Dig. readout, freq. memory,  
elect. keyer, rejection tuning, variable IF, audio peak filter,  
automatic tune-up timer, AC-DC operation, etc. etc. A host of  
new advanced features including, of course, Yaesu's up-to-  
date modular construction utilising plug-in circuit boards to  
minimise service time. See review in "Amateur Radio" Oct.  
'78. This symbol of technical excellence is real value for  
money at **\$1595.**

(Mic., English Language Inst. Book, Connectors, and Pwr.  
Cables are included).

FT-901D, less keyer, memory, DC-DC, **\$1375.**

FT-901DE, less FM, memory, DC-DC, **\$1348.**

FV-901DM Synthesised scanning external VFO, 40 memory  
storage, electronic tuning, etc. **\$475.**

FC-901 Antenna coupler, 500W, Inc. SWR and PWR meters,  
ant. switch and connectors. **\$272.**

YO-901 Multiscope. This is a CRO, TX monitoroscope with  
two-tone generator, and receiver panascopel **\$TBA.**

SP-901 External speaker **\$56.**

SP-901P. External phone patch/speaker. **\$135.**

FTV-901 VHF/UHF/OSCAR. Transverter for 50, 144 and 430  
MHz. **\$TBA.**

CW and AM Filters, **\$63** each. Elect. keyer unit **\$48.** Memory  
**\$172.** DC-DC unit **\$86.** FM **\$58.**

Whether you are looking for a first class  
singer/entertainer or first class commun-  
ications equipment, you must be as  
discerning as we were. Pictured is popular  
Melbourne soprano, Margaret Smith of  
Mount Waverley with the top of the range  
from Yaesu.



**FT-101E TRANSCEIVER:** 160-10 Mx, SSB, AM, CW, PA two x 6J5C, 260W PEP input SSB. 240V AC BUILT-IN RF SPEECH PROCESSOR. Solid state except for TX, PA and driver. IF noise blanker, FET RF amplifier, clarifier, built-in speaker. Mic., English Language inst. Book, connectors and Pwr. cable inc. \$889.

**FT-101E W/DC FACTORY INSTALLED. \$945.** (FT-101E's imported by B.E.S. now inc. a more effective, adjustable N.B.)

**101E DC-DC CONVERTER KIT \$60.**

**FTV-101B EXT. VFO \$169.**

**SP-101B EXT. SPEAKER 8ohm \$49.**

**SP-101PB EXT. PHONE PATCH/SPKR \$135.**

**YO-101 Monitorscope, inc. built-in two-tone. \$399.**

**YC-601B DIGITAL READOUT ADAPTOR** for FT-101E, with built-in AC PS. Includes frequency counter to 30 MHz. \$318.

**M-101 MOBILE MOUNT** for FT-101E. \$38.

**CRYSTAL FILTERS** for CW and AM. \$63 each.

**FL-2100B LINEAR AMPLIFIER:** 80-10Mx, uses 2 x 572B triodes in G.G. twin fan cooled, styled to match FT-101E. Equally suitable for other rigs. \$585.

**L FT-301 160-10Mx** Fully solid state Tcvr, built in RF Speech Processor, 200W PEP Input. \$989.

**L FT-301D DELUXE DIGITAL Tcvr.** Similar to FT-301. \$999. • L FT-301 MATCHING POWER SUPPLY. 20 Amp 12V suit all 301 Transceivers. \$195.

**YO-301 MATCHING MONITORSCOPE** for FT-301 Series. \$399. FC-301 ANTENNA COUPLER 500W, Inc. SWR & Pwr meters, ant. switch and connectors. \$258.

**R-301 RELAY BOX** for FT-301 to FL-2001B. \$23.

**FT-7 TRANSCEIVER**, 80-10M, for novice and mobile. 20W all solid-state. \$565.

**FT-7B TRANSCEIVER**, as FT-7 but with full coverage of 10M Band (28.5-29 installed), 100W peak input, and other additional features. \$685.

**FL-110 SOLID STATE LINEAR AMPLIFIER.** 10-15W drive, 200W PEP Input, 160-10Mx. \$259.

**/ FL-101 TRANSMITTER:** Solid state 160-10M, PA two 6J5C, all facilities. Companion unit to FR-101. \$895.

**/ FL-101 SPEECH PROCESSOR:** For installation in FL-101 \$95.

**/ FR-101D RECEIVER:** All solid state, 23 bands incl. all amateur bands 160-10M plus 6 and 2m, FM, CW, etc., etc. \$1245. **/ FR-101D DIGITAL:** Has all the options of the FR-101D as well as DIGITAL READOUT. \$1455.

(FR-101 requires 8 ohm speaker)

**FRG-7 WADLEY LOOP RECEIVER:** All solid state, 0.5-29.9 MHz in thirty 1MHz bands. Electronic band selection. \$389.

**BATTERY HOLDER FOR FRG-7**, holds 8 size "D" cells for internal battery operation. \$10.00.

**FRG-7000 WADLEY LOOP RECEIVER:** Improved version of FRG-7, extended freq. coverage, digital readout, digital clock etc. \$695.

**FT-625 and FT-225 VHF Transceivers.** Feature all mode of operation — SSB/FM/CW/AM — with repeater offset capability, using advanced phase-locked loop circuitry. AC and DC operation. Similar styling to FT-901.

(FT-225, 144-146 MHz, FT-625, 50-54 MHz)

R model, analog dial. \$895.

/ RD, analog & digital. \$995.

/ RDM. Analog, digital & memory. \$1175.

i, Indent order. L, Limited stocks.

## ANTENNA ACCESSORIES

LA-1, Lightning Arrestor, for installation in standard 52 or 72 co-axial feedline, designed to Mil. specs.	\$76.00
LA-2, smaller size co-ax arrestor	\$4.95
BN-84 Hy-gain ferrite Balun, 2 kW, 1:1	\$30.00
VS-BN Hidaka ferrite Balun 2 kW 1:1	\$26.00
VS-BN4 Hidaka similar VS-BN, 300 ohms	\$26.00
BA-1 Western ferrite Balun 2 kW 1:1, light weight	\$22.00
HN31 Dummy Load Cantenna Kit 1 kW oil cooled (oil not included)	\$45.00
FF-501DX Low Pass Filter, 3 Section, 1 kW	\$39.00
LP-7 TVI Filter low power	\$9.00
KW Electronics L.P. Filter, 5 Section, 1 kW	\$59.90
TV-42 Drake L.P. Filter, 3 Section, 300 W	\$19.00
TV-476 Hy-Gain L.P. Filter, 150 W	\$15.00
TV-75 Drake High-pass filter 50MHz UP	\$15.00
Porcelain Egg insulators	50 cents
WIDE RANGE of Co-axial cable and connectors in stock.	



**1 FTV-650B SIX METRE TRANSCEIVER:** Converts 28 MHz. SSB to VHF, and includes receiving converter. 50W PEP. Primarily designed for coupling with Yaesu transmitters \$290.

**L FTV-250 TWO METRE TRANSVERTER:** Similar FTV-650B. 10W-15W output, but all solid state and built-in AC PS. \$348.

**L FT-227R 2mx, 10W FM Tcvr, 800 Ch, with Dig. Readout, memory, rev. etc. \$365.**

**L FT-227RA** Similar FT-227R but with four memory channels and PLL scanner with control from microphone. \$399.

**L CPU-2500R 2M, 25W FM Transceiver with PLL synthesis in 5 KHz steps, controlled by a central processing unit. Four memory chans., with scanning.**

**CPU-2500R**, with standard mic. with up/down scanner controls. \$545.

**CPU-2500R**, with keyboard mic., allowing remote input of dial or memory chans., programming of repeater splits, scanner control, and tone pad. \$585.

**/ YC-500E 500MHZ FREQ. COUNTER:** Accurate to .02ppm. \$656.

**Y/C-500S 500MHZ FREQ. COUNTER:** Accurate to 1ppm. \$499.

**1 YC-500J 500MHZ FREQ. COUNTER:** Accurate to 10ppm. \$368.

**Y-150 DUMMY LOAD/POWER METER:** For use over the frequency range 1.8-200 MHz. Three power ranges, 0-6W, 0-30W, 0-150W with built-in cooling fan. \$112

**FF-501DX 3-SECTION L.P. FILTER** for TVI reduction. Includes two PL-259 co-ax plugs. \$39.

**F-101 FAN.** \$38.

**YD-844 DESK MICROPHONE:** Yaesu De Luxe PTT Dynamic type with stand, spring and lock PTT switches. PTT also actuated when lifted from deck. Dual Imp. 600/50K. Inc. connector. \$49.

**YD-148 DESK MICROPHONE:** Flexible Goose Neck type. 600/50K. Inc. connector. \$49.

**HAND MIC'S** FOR YAESU, YD-846 etc. with connector. \$21.50.

**YH-55 YAESU HEADPHONES:** 8 ohm. \$19.00.

**SERVICE MAINTENANCE MANUALS:** FT-101 \$27. FT-221. \$19.

**RS SERIES HF GUTTER MOUNT MOBILE ANTENNAS:** RS Base and Mast (doubles as 1/4 wave on 2m), complete, inc. co-ax lead attached RSE-M2. \$29.90. Coil and Tip Rods: RSL-3.5. \$22, RSL-7.21, RSL-14 \$20, RSL-21 \$19, RSL-28 \$19, RSL-145 (5/8 2M) \$24.

Special, \$ Reduced! Limited stocks only.

## STANDARD VHF and UHF TRANSCEIVERS

**SR-C146A**, 2m hand held 5 chan. 2W transceiver, inc. carrying case and 3 chns. \$199.00

**SR-C432A**, 70cm hand held 6 chan. 2W transceiver, inc. carrying case and 1 chn (435 MHz) \$225.00

## STANDARD ACCESSORIES

**CMP00** Hand mic. for SR-C146A and SR-C432 \$25.00

**CAT08** Rubber antenna (helical) for SR-C146A \$10.00

**Heavy Duty Carrying Case** for hand held units \$16.50

**AC Adapter and charger** for hand held units \$35.00

**Mobile Adapter** for hand held units \$14.50

**AC Charger** only \$11.00

**Ni-CAD Penlight Cells, type AA** \$2.90

Multi-band dipole traps centre insulator, 80-10M bands per pair, complete with insulator, KW Western \$38.00

590G B & W co-ax. switch, 5 posn., rear entry \$35.00

TWS-120 2 position co-ax switch \$39.90

ASW-1, Western 5 position co-ax, switch, side entry \$18.00

RS-107 Transceiver tester \$33.00

RS-501 Ant. Impedance bridge, inc. 1 osc. \$68.00

Extra Osc. for RS-501 \$72.00

RS-501 Ant. Impedance bridge, inc. 1 osc. \$16.00

## SCALAR MOBILE WHIPS

**M-22T** 1/4 wave 2m whip top \$6.50

**M-25** 5/8 wave 2m whip top \$16.50

**M-40T** 4.5 dB Gain, 433 MHz \$19.80

**M.B.** Standard base \$4.70

**M.B. UHF base** \$5.80

**MAGBASE** inc. 12ft. of RG-58/AU \$49.00

## SWR AND POWER METERS

**SWR-40, REACE** single meter type, combined SWR and FS meter, 50 ohms, inc. FS pick-up whip, size 5" x 2" x 2 1/4", 3-150 MHz, UHF connectors

\$19.00

**FSI-5, REACE** — dual meters, 50 ohms, Simultaneous reading of forward and reflected power, 5" x 2" x 2 1/4", 3-150 MHz, UHF connectors. Very sensitive, ideal low power use,

\$29.00

**RS-101** Small size SWR meter, with brackets to mount under dash for mobile

\$7.50

**ME-11X, ASAHI dual meter**

\$22.00

**SWR-200 Osker-Block** large dual meters, switched 50-75 ohms, with calibration chart for direct power readings to 2 kW in three ranges. A very elegant instrument. 75/8" x 2 1/4" x 3 3/4"

\$75.00

**FS-600A Hansen Peak Reading Wattmeter** SWR meter 20, 200, 500 and 1000 watts 230 VAC operation. 3.5-30 MHz,

\$78.00

## ANTENNA COUPLERS

**HC-75** Tokyo Hy-power labs. Trans-match 75w PEP

\$77.00

**HC-250** Tokyo Hy-power labs. 250w

\$95.00

**HC-500A** Tokyo Hy-power labs, inc. 160m x 500w PEP

\$159.00

**HC-2500** Tokyo Hy-power. Trans-match 2.5 kw PEP

\$256.00

Limited stocks only at old price

\$256.00

## VHF ANTENNAS

**VS-2GH** 2m 5/8 wave ground-plane

\$49.00

**VS-6D** 4-element 6m Beam

\$68.00

**VS-6GH** 6 metre 5/8 wave G.P.

\$59.00

**VS-07GH** 430 MHz 5/8 G.P.

\$45.00

**DENSO** 430 anti-corrosive compound for jointing antenna and beam elements (as used by electrical authorities). Per tube \$2.90.

## ANTENNAS AND ANTENNA ACCESSORIES

### HF MONOBANDERS

**VS-20CL** 3 elem. W.S. 20m beam, Inc. Balun

\$199.00

**VS-11CM** 3 element 10/11m inc. Balun

\$95.00

**VS-15CM**, 3 element 15m. Inc. Balun

\$128.00

### HF DUO BAND....

**VS-22** Hidaka 3 element 15-11/10m, Inc. Balun

\$179.00

### HF TRIBAND BEAMS

**TH6DXX**, 6-element trap Beam

\$339.00

**TH3Jr**, 3-element trap Beam

\$195.00

**HY-QUAD** 2-element Quad Beam

\$237.00

**VS-33 Hidaka** (Equiv. TH3MK3), Inc. Balun

\$265.00

**DX-33** Western (UK) similar TA-33

\$240.00

### HF MULTIBAND TRAP DIPOLE

**TD-1** Western (UK), 10 THRU 80m. Approx. 110 ft. (34m), ready made with traps, insulators and HD copper wire. Use co-ax or low imp. twin line feeder (not supplied)

\$68.00

**FITTINGS:** (Suit all makes with 3/8" x 24 thread)

\$22.00

BPR, bumper mount

\$24.00

BDYF, heavy duty adjustable body mount

\$20.00

VS-BM Ball Mount & Medium Duty Spring

\$18.00

VS-BP Bumper Mount

\$18.00

### MORSE KEYS, by KATSUMI & HI-MOUND

**EK-150S** Single Paddle Electronic Keyer

\$149.00

**EK-150D** Double paddle electronic keyer

\$149.00

**MK-1024** Programmable Keyer, 1024 bit memory

\$265.00

### HI-MOUND

**HK-808** De luxe, heavy duty morse key. Heavy base

\$25.00

A beautifully constructed and finished unit. Fitted with a dust cover, standard knob and knob plate. Ball bearing shaft. Precise, firm adjustments. This is a really superb "professional" key and a delight to use. Worth every cent of

\$47.00

**HK-70** Heavy duty, lower cost version of 808



**ARX-450**, 435 MHz three half wave 6dB Ringo

432-15H 15-element 430-440 MHz Beam

VS-2GL 7 element 2m Beam

VS-2IL 9 element 2m Beam

\$66.00

### ROTATORS

Emulator:

103LBX Medium duty, disc brake

\$179.00

502CXX Heavy duty, disc brake

\$259.00

1102MXX Heavy duty, mechanical brake

\$389.00

1211 Mast clamp for 103LBX

\$18.00

1213 Mast clamp for 502CXX

\$29.50

300 Mast Stay bearing

\$32.00

301 Tower top bearing

\$32.00

High quality tough PVE insulated cable especially

for external use with rotators

VCTF-7, 7 core cable (for 1100 series)

\$1.40 per m

VCTF-6, 6 core (for 103 & 502)

\$1.25 per m

1103MXX Extra Heavy Duty, high turning torque

\$410.00

1215 Mast clamp for 1102/3

\$45.00

Flexible coupler 451 (for 1102/3 & 502)

\$32.00

Flexible coupler 450 (for 103)

\$16.00

### VHF MOBILE ANTENNAS

AS-2HRF 5/8-wave cowl mount type

\$39.00

VS-07MG 70cm Mag Mount 1/4 wave

\$19.00

HOPE-2R 2 metre gutter mounted helical, only 22

cm's long, incl. co-ax connector

\$26.00

VS-TOWN 2 metre flexible helical on PL-259

\$19.50

VS-MM, magnet mount for VS-TOWN, incl. co-ax

\$20.00

HU-2HR Hidaka 2 metre 5/8 wave 6m 1/4 wave

gutter mount incl. co-ax and connector

\$39.00



VS-LBM Balmount & H.D. Spring

\$25.00

H.D. Spring

\$18.00

AS-GM Guttermount

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QTR-24

Also shown in the photograph is the YO-101 monitoroscope, FT-101E transceiver, YC-601B digital readout adapter and YP-150 dummy load-power meter.



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Application	NBFM	NBFM	WBFM	WBFM	WBFM	NBFM
Number of Filter Crystals	8	8	8	8	8	8
Bandwidth	12.0 kHz	15.0 kHz	30.0 kHz	36.0 kHz	40.0 kHz	14.0 kHz
Pass Band Ripple	←	←	←	←	←	←
Insertion Loss	≤ 3.5 dB	≤ 3.5 dB	≤ 4.5 dB	≤ 4.5 dB	≤ 4.5 dB	≤ 3 dB
Input-Output	820 Ω	910 Ω	2000 Ω	2700 Ω	3000 Ω	910 Ω
Termination	25 pF	25 pF	25 pF	25 pF	25 pF	35 pF
Shape Factor	(70 dB) 2.4	(70 dB) 2.3	(70 dB) 2.2	(70 dB) 1.9	(70 dB) 2.0	(40 dB) 3.0
Ultimate Attenuation	890 dB	872.8	190 dB	2.9	190 dB	2.7
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**Si**

# GROUND WIRES — HOW EFFECTIVE

S. R. Gregory VK3OT  
P.O. Box 414, Hamilton 3300

Here is a plot of the effect of ground wires on signal strength, as used by station engineers planning new installations.

I am sure all the 160 metre buffs and those contemplating any vertical antenna will be interested in the effects of adding ground radial systems. The half-wave vertical shows a power gain of 1.5 dB over the quarter-wave, while with 3.1 dB over the quarter-wave a five-eighth antenna would be the most desirable for any DX work. Conversely, the shorter an antenna the more rapid is the drop off in field strength. The graph is based on a power of 2000 watts. The theoretical field is based on sinusoidal current distribution in the antenna.

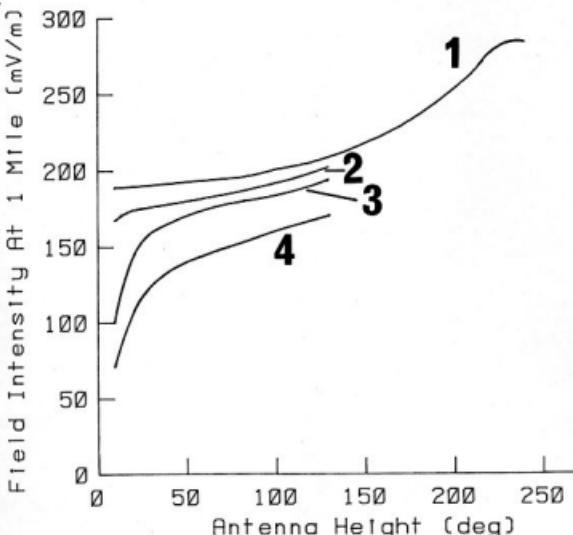
(The test frequency would be roughly 1 MHz.—Ed.)

The author would be glad to provide copies for the price of an s.a.s.e. to above. ■

FIG. 1: Effect of Ground Wires on Field Strength.

(1) Theoretical Field Intensity over Perfect Earth. (2) Measured Field Intensity 113 Radials 150° Long. (3) Measured Field Intensity 113 Radials 100° Long. (4) Measured Field Intensity 113 Radials 50° Long.

Note increased necessity for long ground wires when antenna is shorter than 30 degrees.



## MURPHY'S LAW

Any one who is trying to design anything or build anything should be familiar with Murphy's Law. The basic law is very simple. It states, "If anything can possibly go wrong it will". It can be also stated in a mathematical form,  $1 + 1 \neq 2$ . The symbol  $\neq$  means "hardly ever". Here are some of the detailed applications of the law.

1. Any completed and checked circuit or drawing will be neither completed nor checked.
2. If a project requires "n" components, there will be "n-1" components available. The one missing will be the most important one with no possible substitute.
3. Interchangeable parts won't.
4. Circuits and handbooks will be lost or unavailable.
5. Any wire cut to the right length will be too short.
6. The probability of an error is directly proportional to the amount of trouble it will cause.
7. A dropped tool will land where it can do the most damage. (This is also known as the Law of Selective Gravitation.)
8. Components which must not and cannot be assembled wrongly will be.
9. A sensitive DC meter will always be overloaded and wired in backwards.
10. Any expensive transistor protected by a fast acting fuse will protect the fuse by blowing first.
11. The more tidily wired a circuit is the less likely it is to work.
12. The most delicate component will always drop off the bench.
13. A self starting oscillator won't.
14. Original circuits will be mangled by the copying machine.
15. The resistance which has a critical value is the one which will be missing.
16. Crystal locked oscillators never are.
17. Intermittent faults only reappear after the unit has been completely reassembled.
18. There will always be some bits left over when a unit is reassembled.

—Courtesy of Roy Hartkopf in "Zero Beat". ■

WARC 79 —  
NEXT YEAR

# PORTABLE W4

Leo F. Powning VK5ALP/W4

1821 South Lakeshore Drive,

Chapel Hill, North Carolina, U.S.A. 27514

"W4RHE, this is VK5ALP. Do you copy, old man?" There was silence for a few seconds and I thought Chuck might have resented my interrupting his 40 metre DX QSO with another station.

Then he came back, "VK5ALP this is W4RHE. Holy smoke, I just picked myself up off the floor, you nearly blew my ears off! You've got the biggest signal I've ever heard from VK, how much power are you running?" I laughed so much at Chuck's response, it was my turn to pick myself up off the floor and after apologising for not adding the W4 suffix to my call sign to let Chuck know I was in North Carolina, only 400 miles north of his Florida QTH. We arrived here in June 1977 on a two year assignment with my computer company employer and you may be interested in a "down under's" view of the ham radio scene in the U.S.

First, the good news — 300,000 licensed amateur stations here. Now the bad news — whenever I try to operate on HF they all seem to be on. You work it out, 525 kHz on phone bandwidth on the combined 80, 40, 20 metre bands at 3 kHz per channel gives 175 phone channels at best. NSW add an amateur population 50 times larger than VK and you know why that W you were working last night had to end the QSO because of QRN. On many occasions I've found it impossible to get on HF here without coming up over another station. Linears add to the problem, many stations overdrive and the resultant splatter takes up more bandwidth. I run a Heath SB200 linear but only to compete with the guy down the street who has one, plus it helps me work back to VK through the QRN. Many of the guys here would be happy to see linears barred and legal power reduced. The high power allowed causes more problems than it cures.

From your end there are a few big signals that ride in over the noise, hail, rain or shine, but the prize (allow me to be chauvinistic, fellers) has to go to "Portly Bob" VK5PB with his 3 element 40 metre beam at around 70 or 80 feet. I copy Bob at about the same strength as my wife copies Radio Australia on her receiver!

Repeater enthusiasts would be happy here, we have 100 in North Carolina, which is roughly 100 x 300 miles. Any licensed amateur is allowed to set up a repeater; fortunately the owners co-operate and use frequencies allocated to them by an amateur co-ordinating committee. Soon after arriving here I traded my IC22A on a synthesized rig — had to, I'd have gone broke buying xtals just trying to cover the repeaters in this State.

Two metre mobile is a tremendous travelling aid; I rely heavily on it when trying to navigate my way through the big cities, particularly on the crowded city freeways where all the traffic seems to be

moving like the world's going to end in two minutes and everyone wants to get off. A word of caution. In the southern States we call "Break" when we want to get into a repeater channel QSO; DON'T DO IT IN NEW YORK. I did so and the channel suddenly went quiet. I was wondering where everyone had suddenly disappeared to without a word. Then the channel slowly came to life again and I was politely told that Break is only called in an emergency in New York. Guess they have need of that facility.

Speaking of repeaters, amateurs have a tremendous communications bonus in the U.S. with their automatic phone patch facility. As shown in the photograph, my



Touchtone Pad on rear of Microphone gives access to Repeater "Auto-Patch" and Public Telephone Network. Tone IC in Mic. gets power from rig via simple modification to Mic. Socket.



Because of the service they provide to the community, many States issue Special Amateur Radio Car Licenced Plates

microphone is fitted with a push-button actuated tone generator which generates discrete tones within the audio range for each button pressed; the tones used are internationally known as Q23 series which Telecom are also using in Touchphone installations in VK.

To use the facility I call the repeater, viz., "WR4AGC this is VK5ALP/W4 accessing autopatch". FCC regulations require this procedure so they can audit traffic (all repeater traffic is recorded and held by the repeater owner for a set period); then, keeping the PTT switch down I press the \* button. The repeater receiver recognises this tone as a command to connect to the telephone system and after releasing my PTT switch I hear the "brr . . ." or "off-hook" tone in my receiver; I then dial my number and, hey presto, I have a mobile phone facility. Takes a few calls to get used to the half duplex nature of the phone conversation but no real problem. It's a real aid in reporting accidents or other emergency situations direct to police, ambulance, etc. Pressing the \$ button disconnects the repeater from the phone line. Police here actively seek our assistance in reporting accidents, suspicious characters, etc. A couple of months ago, one of our club members was driving past a bank when two guys ran out and drove off at high speed. He put two and two together and called police on the phone patch, giving their licence plate number. A few minutes later two bank robbers were sitting in the back of a police car wondering what went wrong! U.S. amateurs have been of such assistance in civil emergencies that many States even issue special amateur radio car registration plates. Thought I might have trouble getting one with a VK call, but no problem, as shown in the photograph.

Our local amateur radio club is very active and successful. Around 70 per cent of the members attend each monthly meeting and I think this is due to three major factors: (1) a family atmosphere, (2) the meeting itself is short, sharp and to the point without "waffling" or debate about nothing, (3) interesting and competent invited speakers. The meetings are held in a local fast service, low charge restaurant, which sets an area aside for our use. We and our wives start drifting in around 6.30 for dinner and the meeting is held in the same area at 7.15, with everyone still at

their dinner tables. The business meeting is conducted fairly but tightly and always concludes by 7.45. Then we have an invited speaker.

The speakers are selected such that we have a mixture of technical and non-technical presentations. Speakers in my time here have ranged from the local school system superintendent, who was formerly in the Secret Service and was one of President Kennedy's bodyguards. He told us of his experiences with JFK (fortunately for his peace of mind, he was not on duty in Dallas when Kennedy was assassinated). Another was a qualified tax agent, who advised us of how to pay the least income tax whilst staying within the law. Last month's speaker was a scientist from a local research institute, who made a presentation on commercial communications satellites. Interspersed amongst these were slow-scan, micro-processor and printed circuit board construction presentations (there was a good roll-up the night I gave a pitch on amateur radio in VK). The speakers finish by 8.45 at the latest, so you can see we pack a lot in the two hours. I think you can also see why the meetings are so popular.

I was involved with YRCS in Australia so make my contribution here by teaching Novice classes. Novice theory standard is well below that of VK (at least of the first few VK Novice exams which I feel were ridiculously high) and about 80 per cent of our students pass the licence exam. We conduct the CW test ourselves and supervise the theory exam which is sent to us by the FCC.

Up to 60 per cent of the Novice students are ex or current CBers; you only have to listen to the CB band for a few minutes



Hope you can read this invitation by the world's largest mail order house. You certainly won't read the fine print advising that you will need also an Amateur Licence.

to understand why they have become disenchanted with CB. Beats me how any CB sets are sold here; I've listened a few times and it's been complete chaos with stations all over one another; I understand it's going the same way down there. A group of CBers here decided to solve their problems by forming an association called "HF International". This body issued call signs and allocated frequencies OUTSIDE the CB band for their members! Needless to say, the Federal Communications Commission moved in very smartly, confiscated equipment and fined members.

Take a look at the advertisement on this page which one of the largest retailers in the U.S. is running in their mail order catalogue. Notice the resemblance to the early days of CB sales in Australia. Only in the fine print is the prospect told he will need a licence to operate this 2 metre gear. I wonder if we've got another batch of pirates coming up; the big retailers don't go into a market unless they can make big sales. If we don't succeed in containing illegal 2 metre operation here, you can be it will spread like a scourge to VK; should the WIA be moving now to seek legislation preventing sales of 2 metre gear to unlicensed buyers while there is still time? (The WIA has already sought such legislation for ALL amateur transmitting equipment—Ed.)

If you are planning a trip to North America, your "full call" in Australia will qualify you for Extra Class privileges here. (But only for those with 14 w.p.m.—Ed.) This is a good deal since Extra Class licensees have additional space reserved for their use on the bands (to gain the Extra Class licence U.S. amateurs have to pass a code test at 20 w.p.m.). To apply for permission to operate you'll need to write to the FCC here for their form 610A. Complete the form and send it to them no later than three months before arriving in the U.S. or you might be carrying a useless piece of iron around with you during your visit. I have operated during business trips to Canada; reciprocal licensing is much faster there; I just walked into the Department of Communications office with my VK Certificate of Proficiency and Station Licence and came out five minutes later with approval to operate. Only catch was that I had to leave my 2 metre rig at the Toronto Airport customs counter until I could produce a D or C approval to operate. The trip to and from the Department of Communication cost me a \$25 cab fare so maybe you should also line up a reciprocal licence with Canada ahead of your visit just in case you meet the same customs officer I did, mutter mutter.

If you make a trip over here you'll find the Australian/American bond as strong as ever and you will be made welcome just as we have, so seven Aussies in the South ask you to return Australian hospitality to any visiting U.S. amateurs. 73s and our QTH is as shown on this article if you are passing through North Carolina. ■

# LOVE'S LABOR LOST

Alan Shawsmith VK4SS  
35 Whynot Street, West End 4101

Fred's life was all dragons and disaster: his marriage was a mess and his job a salt mine. He yearned for two things — escape from Bessie, the YF and to do a Dx-pedition. The former would bring heavenly peace from the griping yakkiti-yak that started up every time he went on air: the latter would raise him from the ranks of the also-rans, to someone of "status" in the Dx world. The poet once said "Give me honour for an hour rather than a lifetime of non-entity" — and Fred, in his depressed and harassed state, believed it.

Somewhere along the marital way he had lost the battle of the sexes. It was he who'd become the object and chattel. No longer did he dare to have a few beers with the boys, or a nibble on the nags at the week-end. He did, however, manage to sneak into the Radio Club meets on the nights he worked back. He gave the boys the same old spiel — "He was planning a Dxpedition". After he'd gone, there were jokes all around; any Dxpedition would be better off without Fred — he was a disaster area in himself, the world's most fumbling op. Anyway, they knew he'd never make it — not with Bessie around.

But fate fiddles in the fortunes of us all and one day it dealt Fred a blow that gave him a chance to change his dream into a practical scheme. The blow was in the form of a knock on the noggin by a length of lumber in the yard where he laboured. As he came to, a blinding flash of inspiration shot through his mind. Like someone who had suddenly seen a chance to fake death, yet live, Fred saw a way to escape his OG and do a Dxpedition.

"I'm feelin' worse," he told the foreman, after he'd been lying moaning in the rest room for two hours. Actually he was only foxing: his injuries were superficial but his mind was alert and in a whirl with a sudden escape plan. The boss came in and told them they'd ring an ambulance to take him to the hospital.

"No," said Fred, "but, if it's OK with you, I'll take my holidays and sick pay now."

"But you're a month early and what'll I do for labour?"

"Yeah, but I've been overworked on overtime!" Fred was beginning to feel

desperate: to put his plan into action, he'd need a full pay packet or ND. The boss toted up his sick, holiday and overtime pay and farewelled him with a slap on the back that was almost a push through the door. He realised that he'd been given the "dry wipe" and they didn't care if he returned or not.

He'd decided to shoot through to Hong Kong, so first he must check the delay on the issue of reciprocal licences. There were more exotic spots nearer home, CR8 or YJ, etc., but Hong Kong it had to be, for several reasons. It must be some place where he could buy a rig right off the rack; not taking his own along, Bessie would smell more than a rat.

To his surprise, the reciprocal licence was a breeze, brought about mainly by the fact that the bloke on the other side of the counter was a Ham who'd been to VS6 land and said he'd see the ticket through personally, thus proving the old adage that it's who you know that matters, rather than what.

Now for the last snag: to rid himself of the albatross around his neck — the OG. On the way home he bought from the first chemist shop a long white bandage, slipped into a public toilet and wrapped the top of his head in it, right down to his ears. Bessie was out. This gave him time to dig out an old doctor's certificate; he just might need it as a bluff.

Bessie found her OB lying on the sun-room sofa with his head swathed in cloth. Her greeting was one of suspicion rather than concern. "What's up?"

"Got lumbered at work. The ambulance took me to the nearest Doc and then brought me home," he lied, "I've got two weeks sick leave but if I don't feel fit, I can make it three."

Anger rose in his OG's face. "I see, we starve while you sit for three weeks in there, at that — at that." She flung an arm in the direction of the shack.

"No," said Fred, trying to play it cool, "the Doc says I'm run down, so I'm going up to Frank's place." This was his brother and the only man Bessie would not face, so Fred felt safe.

Anger turned instantly to hate. Her gaze fixed intently on the OG's bandaged head. She smelled a rat, "Take it off!" she commanded. Uri Geller's stare bends spoons but Bessie's is more potent: it lays the

mind bare, right to the grey matter. For the second time in one day, Fred grew desperate. Under the OG's penetrating gaze, the bandage on his head felt as if it was about to unwind itself. He played his last card — the bluff. Reaching into his pocket he produced his certificate. "Here," he said, "check this with the GP and see if I'm badly hurt or for Gawd's sake belt up!"

After a moment's hesitation, Bessie turned on her heel without a further word. He was free but could hardly believe it. Through the barrier and loose at last: it just wouldn't sink in. Like some Indian swami, he averted his swathed head and raised his arms in silent but ecstatic gratitude at the benevolence of the gods.

Early next morning, before sneakily boarding the plane for "The Pearl of the Orient", Fred fell to temptation: he put a call through to one of his Club mates. "Tell the boys I'll be QRV — 80 through 10 from VS6 — for the next three weeks . . . Yeah, that's right, VS6." He just had to brag a little, but as is so often the case, it was to be his undoing.

The fact that Fred VK2 had got loose from his bag of strife, the YF, was news — and before the morning was out, most of the local Hams and their YFs knew of the happening — and before the day was out, Bessie had picked up the gossip in the village market-place. With a frightened fuming fury, she knew her whelp of an OM had done a double cross.

At the same time as Bessie was getting into action in Down Under, Fred was serenely absorbing the new exotic sounds and smells of Hong Kong. His "digs", arranged for him by the Ham at the R.I. Office in Sydney, Australia, turned out to be a small but neat unit, on the top floor of a high-rise apartment block on Victoria Peak. The following morning Fred stood on the pocket-sized patio and gazed down and around and rubbed his hands in sweet anticipation. He was so high, that looking eastwards, he felt he must surely see the States. He fingered the iron balustrade — perfect; just right to mount an all-band vertical. Already the music of the bedlam of the pile-up was in his ears: his dream of so long was about to be realised. Three weeks of it — the thought made him feel just a little giddy with anticipation.

There was a knock on the door and the Chinese janitor nodded his way into the room. "Eve'thing OK, Mister Fred?"

"Oh yeah, sure — just great."

"You're busy man next few weeks?"

"You can say that again, Mac, I'll be a 'stayput' tenant!"

"Then maybe you like a little extra room service. Cook, make bed, clean up, eh?"

"Well I —"

"OK, you talk with Yo Yee." He gave a little clicking sound and retired and there materialized in his place the sweetest little oriental bird Fred had ever set eyes on. She stood before him, all of 5 ft. nothing, as perfectly formed as the finest alabaster sculpture: a study in cream, black and red.

"I come at five, fix your dinner, supper, clean up, fix clothes," she paused and her gaze shifted to the bed. The tiny nostrils dilated for an instant "and then I go early — early, 5 a.m., because I work downtown in daytime. OK, eh?"

"Er — I, er, yes. In the morning — Oh year, sure baby!" When the proposition took hold, there was a sudden tingling. He could hardly believe his senses.

She was gone, leaving only a rich, scented fragrance. It was all so sudden. Fred wondered if she really had been standing there before him. Back on the patio, he gazed down on the Suzy Wong district and smiled. "Why do I need it? I got it all up here — well almost." The added anticipation made him giddier than ever.

Now that the janitor had so blithely put an oriental dish on his account, so to speak, he waited for him to re-appear, to tidy up the details. No one appeared. He was finally told it was the gentleman's day off and he never returned till late at night, so Fred took himself downtown and shopped around till he found a natty 5-band QRP Xceiver, complete with vertical. He nearly didn't buy it. If he went over big with Yo Yee, he might need the cash; but he made the deal, returned to the apartment and set it up, ready to go. He switched on and spun across the bands and chuckled with glee — DX was pouring in, from all over. He could hardly wait: tomorrow he expected a GPO clearance to transmit. Turning it off, he sat on the bed and rubbed his hands with pleasure. He couldn't decide which, or who enticed him the most — the rig or Yo Yee — DX or sex. Maybe she could cook too!

Right on 5 p.m. there was a knock on the door. Fred smoothed his hair and purred in his most let's get together voice, "Come on in, Honey." It was swung wide — and in walked his Honey of ten bitching years — Bessie! Fred's jaw hit his chest only to rebound back and his teeth chattered like a relay gone berserk. "Bess — s-s-s," was all he could muster.

"Yes," said his OG, surveying his pad, "so, this is Franks place. My, he has come on: does he own it — and who fixed your head? Some Hong Kong miracle quack!"

At that very moment, Yo Yee hove into view at that end of the corridor. Fred leapt

for the doorway, making strange jerky waving motions with his arms. Yo Yee hesitated, just for a moment, before sizing up the situation and then continued on along the hall, past the unit and out of his life, before she ever had a chance to get into it.

"Who was that?" asked the OG, appearing from the balcony.

"Dunno," said her better half, "just one of the tenants, I suppose." He tottered to the nearest chair, feeling faint.

Bessie began to sniff the air. "Scent," she said, "a woman's?"

"It's incense," said Fred desperately. "They all burn it round here: or, it's my after shave lotion."

Her roving eye settled on the new QRPer. "Did Frank provide that, too?" Then, with a note of final triumph, she added, "I'll bet you're wondering how I found you!"

"No," lied Fred, "but you should join the CIA. They want Marta Haris real bad." He braced himself for what was to come — a "bash" that would go on late into the night.

It was 5 a.m. in The Pearl of the Orient. Fred hadn't slept a wink. Downtown, the early morning noises heralded a new day but the apartment was still all quiet. Without warning there was a firm knock on the door, followed by the janitor's sing song voice calling, "Missee Yo Yee, Missee Yo Yee, time you get out of bed. Time for work." Late home the previous night, he didn't know the situation and had goofed. Fred lay petrified: had Bessie heard? Suddenly, there was a roar from alongside him and the OG leapt from the bed. "You —, so that's who that little love dove was who fluttered past here last night. Coming in to nest, was she? Incense, after shave, huh! Is this more of Frank's service?" With a single sweep of a sturdy arm she stripped the bedclothes off Fred. "Get up, you sneaky Don Juan — you crummy Casanova. We're taking the first plane back home." Bessie felt she'd been one-upped twice in 24 hours by her OM — and that was unthinkable. Fred opened his mouth to argue but thought the better of it and lay silent. Half his dream had already flipped into a nightmare but the rig was all set to go: he was still determined to see out the full vacation, even if Bessie screamed in his ear for the whole time.

As if sensing her OM's resistance, Bessie's eyes settled again on the small QRPer, up in the corner. With an enraged snarl she ripped it clear of its coax, flung wide the door and hurled it down the nearby trash chute in the hallway. From below came a splintering crash, as it and the last vestige of Joe's sweet dream disintegrated forever, without so much as a single CQ from VS6.

That all happened six months ago and Fred, a VK2, has never been on air since. When asked, Bessie gives a strained smile and says, "Oh, he's up at Frank's place, working —" But his Club mates smirk

and know better. Rumour has it that on returning to Down Under, he lost his glue, came unstuck, opted out and fled to the mountains to a secret hippie commune — and each night, when the raving voice of his exOG comes up to haunt and taunt him, he blows his mind on "pot".

## TRY THIS

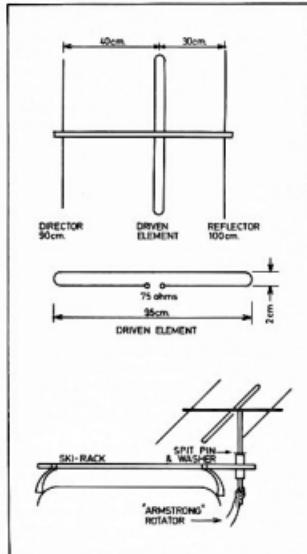
WITH THE  
TECHNICAL EDITORS

### A 3-ELEMENT 146 MHz "MOBILE" BEAM

The following describes a simple beam which would be suitable for use in hidden transmitter events. It has reasonable front-to-back ratio and with the dimensions given the impedance at the centre of the folded dipole is about 70 ohms. A 1:1 balun should be used at the antenna feed point if coax is used, but it does not seem to be very important. The boom could be made from aluminium tubing or dowelling and the elements could be made from aluminium wire. However construction details are left to the constructor.

Mounting the beam on the car becomes the next problem. Ski-bars appear to be about the simplest answer. A piece of tube welded at right angles on the end of the bar will serve as the bearing and support for the mast of the beam. A split pin and washer should prevent the mast sliding through. Leave enough protruding to allow the "Armstrong" rotator to get a good grip. Don't forget you will still want to get the door open.

From "Tuned-In" Nov. 1977.



# HOW TO GET THE STUFF INTO THE HOUSE

Unless your home operates on the kind of budget that permits sable coat Christmas presents for the XYL, swimming pools for the kids, your own ski chalet, and casual week-end jetting to Acapulco or Majorca, chances are you are up against a problem that has faced nearly every ham since Marconi; How to get the stuff into the house unseen . . . or, alternatively, how do you avoid telling her how much it cost?

Over a period of some years of supporting several hobbies and during which acquisitions of new and used cameras, lenses, fly rods, table saws, shotguns, sports cars, etc., to say nothing of radio gear, had to be explained, rationalized, lobbied or even concealed, this practitioner has assembled a variety of ploys, some from personal experience and others from fellow-hobbyists, whose contributions I acknowledge with thanks and whose identities I had best keep to myself.

In the hope that some fellow-sufferer may find herein the solution to his particular problem, I have decided to compile and publish the best of these stratagems in what might be called "Hamsmanship, or How to Build Your Amateur Radio Station Without Actually Shedding Blood".

Old masters at the game — AM types and single-letter prefix gaffers — may find some of these tactics old hat. But they will realize that a whole new generation of amateurs has come along and, further, the problem of getting the stuff into the house without touching off domestic warfare has recalcitrated astronomically in these days of nearly 100 per cent store-bought stations. Even the newest Novice, judging from the magazine photos, starts his career with an array of commercial gear that looks like the control panel of an Apollo moonship.

These new Hams need our help. Let us share with them our secrets and our methods. The future — possibly even the survival — of amateur radio may well be involved. One word of caution before we begin the lesson: Do not, repeat, do not leave this lying about the house for her to read. Commit these pages to memory and then rip them out and either burn them or put them in an envelope and mail to Box 88, Moscow. That way they'll never be heard of again.

Now, then:

1. This one calls for the breezy, off-hand treatment. You bring in the new scope, linear, keyer or whatever it is and before she can start with, "How much did

that cost?", you cry happily, "Boy, you couldn't beat this for \$15" (or whatever figure the traffic will bear). Remember, you didn't say you paid only \$15 for it — just that you couldn't beat it for \$15 — and that's the gospel truth.

2. The old-mule-trader ploy. You come gaily into the house with your latest treasure, a smug grin on your face, and emit something like "Wow! Look what I traded old Haywire Magee out of for my old rotator." Never mind mentioning that you also forked over \$250 in addition to that old rotator to make the "trade".
3. A variation of No. 2: Your line is, "Can you imagine the dope letting this go for only \$35?" You sure can't, OM. His rock-bottom price was \$150 and that's what you coughed up. But you didn't say you paid \$35.
4. Another variation: You take the old rig to your friendly local Ham dealer who sells used gear on consignments for a commission. A few weeks later you report happily "Some guy bought my old rig and I got enough for it to get this new one". Yeah, enough maybe for the down payment — but who needs to know you still owe the friendly local, etc., \$396.80?
5. Become a home-brewer. Spend long hours in the basement workshop. Cut lots of scrap metal loudly. Drill lots of holes ditto. Bang chassis around. Let the smell of soldering and scorched insulation permeate the house. Study schematics at the dinner table. On the air, talk loudly about the linear you're building. After two or three weeks of this, come proudly upstairs with the new rig, or whatever. Stripped of name-plate, of course, or even without front panel. Some time later you can "acquire" a cabinet or front panel for it and . . . "Look, Honey, this old Collins (or Heath or Swan or . . .) panel I picked up just fits the rig. Looks real commercial, doesn't it?"

6. You need a garage or workshop where you can cache the parts of a beam for this one. Then you make a big show of going into the shop with an armload of old aluminium tubing, busted TV antennas, etc. Emerge some days later, after the usual drilling and sawing noises, with the elements of your new tri-band beauty and, "See what I lashed up. Amazing what you can do with a bunch of old aluminium."

7. Your XYL has been bugging you about getting a new colour TV. So you agree to buy one if you can have the old one for parts. Show her those great articles about how you can build a five-band KW receiver with the parts scrounged from old TVs. You'll be surprised, and you hope she will be, too, at the nifty new (frequency counter, oscilloscope or whatever it is you dream of) you were able to build with those old TV parts (plus a few odds and ends from Heathkit, maybe).

Many other suggestions for inclusion in this article were considered and discarded for such reasons as requiring outright lying, being too impractical or far-fetched, or too susceptible of detection. Others simply were variations of one or more of the above, such as disassembling a Whizzbanger 2000 at a friend's shack and then bringing it home piece-by-piece in pocket-sized components; or installing a new KWM2 in your old Viking 1 cabinet.

None of those so far mentioned, however, can top the one reported by a Ham who of necessity shall remain unidentified here. At the time the first colour TV was acquired for the family, he convinced the XYL that only a 60-foot tower and super-duper king-size antenna would bring in the colour picture in their location. To this day she thinks that three-element trapped Lightningbird Tribander is what makes Doris Day pretty.

From "The Lyrebird" Winter 1978 — ex 73 Magazine.

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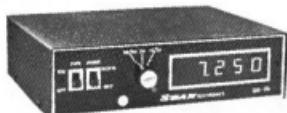
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# VK VISITS JA

Fred Herron VK2BHE  
President, Summerland Amateur Radio Club

As I sat back and relaxed, I was thankful for the warm plush interior of the limousine. The driving snow beat mercilessly against the exterior of the vehicle, and I pelted the driver as the wipers shuddered against the rapidly accumulating snow on the windscreen while he fought to control the vehicle as it jolted through the heavy snowdrifts and over the dangerously icy surface of the road. Hey! Wait a minute! What has this all got to do with Amateur Radio? It sounds more like a scene from a Russian spy movie. In fact it was the last leg of my journey, as a guest of the Yaesu Musen Company in Japan, to visit the Yaesu Musen assembly line at Sukagawa, near Fukushima, about 240 km north of Tokyo.

I was in Japan, as leader of a group of 18 Australians, on an exchange visit between my home city of Lismore, NSW (the headquarters of the Summerland Amateur Radio Club), and the Japanese city of Yamato Takada. These two cities have a "Sister City" relationship extending back to 1963, which involves an exchange of citizens between the two cities about each two years, with the object of fostering friendly relations and better understanding between our two countries. The concept originated in Lismore and has since spread throughout Australia and Japan.

During the course of numerous JA QSOs throughout the months preceding the tour, I had received many invitations to "eyeball" QSOs with individual JA amateurs and amateur groups and organizations, including a very warmly worded invitation from Mr. S. Hasegawa, the President of the Yaesu Musen Company. The story of the overwhelming hospitality extended to me by individual JA amateurs and groups would fill a book in itself, and because of limitations on space I will have to confine this narrative to my visit to Yaesu Musen.

Mr. Hasegawa had deputised a member of his administration, Mr. Chip Margelli K7JA, to be my guide and mentor for the visit to the Yaesu Musen Company facilities, and from the moment he met me at my Tokyo hotel that morning he proved to be a most knowledgeable and efficient young man who was obviously convinced that he was a part of the world's greatest amateur product organization. After a short cab ride to Tokyo station, followed by some mysterious dealings at ticket windows and platform barriers, we boarded an impeccably clean express train and settled comfortably into a typical carriage of what must be one of the finest railway systems in the world.

As we travelled the long journey north to Fukushima, Chip told me about the interesting history and current operations of the Yaesu Musen Company, as well as about his work. He has been in Japan about 18 months, and is mainly involved in the production of English manuals for Yaesu equipment, which involves close co-operation with Company engineers in the research and development laboratory

in Tokyo. He is also involved in liaison with overseas dealers and marketing outlets. From time to time I noticed through the train window that the weather outside appeared to be rather bleak, and as we climbed into higher altitudes snow began to fall. By the time we reached Fukushima we had a fully fledged snow storm on our hands, and I began to yearn for sunny Summerland. It was a thankfully short dash from the station, across icy pavements, to a nearby heated restaurant, where we were fortified by a delicious hot meal and a thimbleful or two of hot saki (they don't serve it in middies). Then began a nerve-wracking car ride, through driving snow, to the Sukagawa facility of Yaesu Musen, which brings me back to the opening paragraph of this story.

On our arrival at Sukagawa we visited the first of the three assembly plants located in the area. The three plants were very similar in appearance, layout and operation, so a general description here will be sufficient to cover them all. The

overall impression is of cleanliness, order, and intense activity and concentration on the work at hand. An overpowering smell of burning resin prevails throughout the buildings. The photograph accompanying this article shows the standard production line configuration. Although Japan is a male orientated society, this is one area in which the females dominate. Apart from management staff, and a very small number of males in quality control sections, the production line staff are exclusively female. They made a pretty picture that day, with their white caps and white gloves, as they worked intently on the job at hand with an occasional quick shy smile at the strange foreigner who walked down the line. We saw the rigs grow from the bare bones of the basic chassis frame and a single PC board, to the finished packaged product ready for shipment. A particular point in each production line it was rather unnerving to see delicate little Japanese women thumping, banging, crunching, and bashing gear which we would normally handle with kid gloves, just for the purpose of revealing possible hidden faults. Predominant among the rigs we saw coming off the lines that day were the FT-221R, FT-227R, and of course the perennial FT-101E/EE. However, pride of place went to the revolutionary new FT-901DM, which all at Yaesu believe to be the pace setter for the future. Testing and quality control procedures were obviously carried out meticulously, and I was left in no doubt that it would be the rare fault indeed which slipped through.



Sukagawa assembly line of Yaesu Musen Co. Ltd.

Apart from the obvious quality of the production facilities, general staff abilities were excellent and morale was high. It was refreshing to see a dedication to the production of high quality and high output which is rarely seen these days. Loyalty to the product and the Company was evident throughout the organization. For the statistical minded, the Company employs about 650 people in three assembly plants, plus administration offices

and a research and development laboratory. Approximately 100 rigs come off the lines each day.

Our departure from Sukagawa was marked by the minor drama of the driver using a millet broom to sweep the snow off the bonnet and windscreen of the vehicle which took us back to Fukushima station. After returning to Tokyo, I spent the next day browsing through the

Akihabara District, world renowned as the Mecca for electronic enthusiasts, with more electronic stores to the square mile than you can possibly imagine—but that is another story.

My visit to the Yaesu Musen Company, a truly remarkable organization, will long be remembered as a most memorable and exciting experience.

SAYONARA! ■

## SETI (SEARCH FOR EXTRA-TERRESTRIAL INTELLIGENCE)

Once in a while something unusual turns up which seems worth sharing with members. In 1976 at the request of a great number of ITU Member Countries, the CCIR adopted Question 17/2 on "Radiocommunications Requirements for Systems to Search for Extra-terrestrial life".

AR readers will be familiar with the abbreviations ITU and CCIR in particular relation to WARC 79. The ITU have issued a series of papers relating to itself and its technical committees for the 10th World Telecommunication Day, 17th May 1978 and the articles now to follow are printed with due acknowledgement to the ITU.

### 1.1 BACKGROUND

Many scientists believe that life is common in our galaxy and that it could develop into civilizations. Civilizations with similar technical achievements to ours could communicate with each other by radio waves up to distances of 100 light years.

The possibility of receiving communications from an extra-terrestrial intelligence (ETI) was first pointed out in 1959, and a search was proposed for possible signals (Cocconi and Morrison, 1959). Independently, Drake and others attempted to detect signals from possible civilizations on nearby stars. Similar attempts have since been made at other observatories (Sagan and Drake, 1975). The first "aimed" signal was transmitted into space from the Arecibo Observatory in November 1974 (NAIO, 1975).

Using present technology it is feasible to detect radio signals arriving at the Earth from other civilizations in the galaxy. Such a programme is called SETI (Search for Extra-Terrestrial Intelligence).

There are at present several SETI programmes in progress (Sagan and Drake, 1975). These include the following:

1.1.1 Bridle and Feldman, at Algonquin Radio Observatory in Canada, are searching nearby stars at 22.2 GHz, near the  $H_2O$  line.

1.1.2 Dixon and Cole, at Ohio State University Radio Observatory, are making an all-sky survey near the 1.4 GHz hydrogen line (Dixon and Cole, 1977). This survey has been in progress continuously for three years.

1.1.3 Drake and Sagan, using the Arecibo Observatory in Puerto Rico, are observing several nearby galaxies

at 1420, 1653, and 2380 MHz (Ponnamperuma and Cameron, 1974).

- 1.1.4 The Soviet Union SETI programme (USSR, 1974; USSR, 1975).
- 1.1.5 Kardashev, using the Eurasian Network, in the USSR, is searching for pulsed signals, with hemispherical coverage (Kardashev, 1976).
- 1.1.6 Troitsky, using the Eurasian Network, is searching for pulsed signals in an all-sky survey at 1.9, 1.0 and 0.6 GHz (Troitsky et al., 1974).
- 1.1.7 Zuckerman and Palmer, using the NRAO Observatory in Greenbank, are searching nearby F, G, and K type stars near 1420 MHz (Palmer and Zuckerman, 1972).
- 1.1.8 The United States National Aeronautics and Space Agency is currently conducting a search near 1.5 GHz (Tarter et al., 1977).

### 1.2 Average distance between civilizations in space

The average distance between civilizations must be inversely proportional to the cube root of the space density of the civilizations, which is also proportional to their average life.

For the existence of civilized life within 100 light years of the Earth to have a high probability, one must assume an average life of at least 107 years.

### 1.3 Other civilizations

Based on the following argument some experimenters may assume that the other civilization would be more advanced than ours. We have only been able to communicate with an equivalent civilization by radio waves during the last 30 years. Consequently, if they can communicate, but are nevertheless behind us, the state of development of the other civilization cannot

be more than 30 years behind ours. As 30 years is an extremely short time compared with the time scale of evolution of life, the probability that this would be the case is very small. Similar logic shows that they are unlikely to be only slightly ahead of us. In the previous section it is stated that an average life of communicating civilizations would be of the order of 107 years. It is concluded therefore, that the other civilizations are probably considerably more advanced than ours.

Such civilizations may have formed a community through radiocommunications and may have been continuously sending signals to suggest that we join the community.

### 1.4 Consequences of success

Interstellar communication is merely hypothetical before the first contact is made. However, as soon as a contact is established, practical implications to us may be significant. The large-capacity communication following the first contact may contain information far superior to our knowledge.

### 1.5 Types of stars to be sought

Stars which are similar to the Sun may have planets suitable for life similar to that on the Earth. Such stars have surface temperatures of 4500 to 6500 K and luminosity of 0.3 to 3 of the Sun, and are known as main sequence stars with spectral types of F, G and K (Sagan, 1973).

The following paper on this subject is one in a series of feature articles prepared by the ITU Public Information Service on the occasion of 10th World Telecommunication Day.

### 2. RADIO MESSAGES FROM OTHER CIVILIZATIONS

Assuming that other intelligent beings might broadcast messages to the planet Earth, what would a radio message from another civilization be like? To start with, it might be extremely long, taking many years to complete. Any assertion about the frequency an extra-terrestrial communicator would use, the nature of his civilization, his reasons for communicating with us, indeed his very existence can be little more than speculation. Even when informed by our scientific knowledge, the obvious speculativeness of these assertions only serves to demonstrate that our scientific

knowledge is terracentric — that is, restricted to what we can learn from a point of observation on the third planet circling a sun in a remote spiral arm of the Milky Way, one galaxy of billions in the universe. In short, we know very little. When we raise the question of intelligent life elsewhere, we should recall that we still do not understand how life emerged on earth.

Although not the slightest encouraging sign was found for many years, interest in the possibility of such an event as picking up artificial signals from outer space has grown steadily. Finally in 1965, the ITU Centenary year, Soviet scientists announced that they had observed regular radiation fluctuations of a distant star. A galactic radio source — called CTA 102 — seemed to be fluctuating in its effective radiated power in such a way as to suggest a deliberate form of modulation. Some scientists were sceptical, however, not because they did not believe in the possibility of other civilizations in the universe, but simply because the particular object seen by the Soviets was a quasar, one of the biggest emitters of radio waves and light yet found. For any intelligence to make it pulsate, a super-super race would indeed have been necessary. But since this radio source was over several thousand light years distant, there was no chance of such a direct verification of the matter as an interrogation of the star by a terrestrial radio station (a light-year is the distance which light travels in one year, namely 9 461 000 000 000 km or 299 792.5 km per second). We realise that the most difficult of all obstacles to contacting people on other planets is the astronomical distance between possible radio sources and the planet Earth. The signals picked up from CTA 102 consequently were emitted many thousands of years ago.

The radio astronomers of ITU Member countries use the largest and most sophisticated modern radio telescopes to listen for radio messages from deep space. But the astronomers have not heard anything yet. This may mean that either nobody is out there or that perhaps the astronomers are listening on the wrong frequency. An extra-terrestrial could be using any one of an infinite number of possible radio frequencies. There are of course many frequencies which are subject to interference from natural radio sources in outer space. These include radio emissions from speeding electrons caught in galactic magnetic fields, the low temperature background noise probably left over from the big bang which created the universe, and possible radio emissions caused by changes in the rotational and vibrational motion of molecules in our own atmosphere. Only part of the microwave spectrum — roughly the range between 1 and 30 GHz — is only minimally affected by this interference. Here a cosmic window was readymade for use by our astronomers and hypothetical extra-terrestrial broadcasters.

The Geneva 1963 Extraordinary Administrative Radio Conference, reserved worldwide the frequency 1420 MHz or 21 cm

wave length, for radio astronomy. It is a natural frequency of emission of the hydrogen atoms in space and was discovered in 1959. The discoverers, two astronomers, Giuseppe Cocconi and Philip Morrison, argued that even very different species, once they had reached our level of technological development, would recognize hydrogen as a kind of cosmic common denominator and use its frequency for inter-stellar communication.

Unfortunately, the very abundance of hydrogen, in the form of vast gas clouds in inter-stellar space, means that there will be considerable noise on this frequency. Thus, astronomers found themselves hypothesizing that the extra-terrestrial broadcaster would be transmitting signals, not on the hydrogen frequency, but on a band in its vicinity. Consideration of these factors establishes a preferred frequency band several hundred Megahertz wide, near 1.5 GHz. A narrow band of frequencies centred at the 4830 MHz formaldehyde line and other frequencies, especially these currently used by radioastronomy, will also be observed to search for extra-terrestrial life.

A group of U.S. scientists under the leadership of Dr. Woodruff Sullivan of the University of Washington, Seattle, came to the conclusion that the 300 star systems nearest the Earth could detect the presence of intelligent life here from our television signals, if their inhabitants have at least the technical knowledge and curiosity of late twentieth-century man. These scientists found that the most intense radio emissions from Earth come from the United States and the USSR. These radar signals could be detected 250 light years away by an observer with our present technology who built an antenna system like the array of a thousand 100-metre dishes proposed for the United States project Cyclops. However, these extremely powerful radars are very few in number and their frequencies are constantly changing, so they would be unsuitable for long-term monitoring. The University of Washington scientists calculate that a strong five megawatt ultra high frequency (UHF) television station could be detected by a receiver of the Cyclops type up to 25 light years away. About 300 stars and their orbiting planets lie within that range. Although there are 15,000 television transmitting stations in the world, the American scientists say that the problem of detecting radio leakage from the Earth is equivalent to detecting the strongest single station alone. They show that it would pay an investigator to sweep the radio-spectrum with an extremely narrow bandwidth of 0.1 Hz looking for individual stations, rather than attempt to catch several transmitters at once with a much broader bandwidth, as all Earth-based searches to date have done.

Some astronomers point out that they have only been listening for intelligent signals for the last 17 years and have only been broadcasting for the last 50 years. Such time spans are infinitesimal on a galactic scale. Most extra-terrestrial broad-

casters are probably going to have had much more experience with inter-stellar communication than we have. If their pattern of technological development is similar to ours, they are going to be much more advanced.

Many astronomers engaged in the search for extra-terrestrial intelligence argue that the exchange of scientific and technical information would be of inestimable benefit both to us and them. A few scientists have tried to attract the attention of extra-terrestrial broadcasters. And, in 1974, the first "aimed" signal, a complex message was transmitted from the Arecibo telescope in Puerto Rico, with its antenna 3000 metres in diameter. Proponents of the search for extra-terrestrial or humanoid argue that it has a sound scientific basis, pointing out that it is just as ridiculous to assume there is nothing out there as it is to state without proof, that the universe is teeming with life. They are simply trying to test scientifically whether such life exists outside our solar system.

But what would happen if we ever did receive a message or made contact in any other way with extra-terrestrials, with people on other planets? Should the news of radio contact with other civilizations ever be made public?

Responsible scientists who have investigated this question for their national space administration, think that this may not be advisable. And yet the influence of such discovery might have beneficial effects on international relations leading to greater unity of mankind on earth based on the age-old assumption that any stranger is threatening.

Would any really superior civilization wish to do us any harm? If we suddenly found ants wanted to talk to us by radio in a manner we could understand, would we therefore immediately exterminate them all, without listening to them and learning all we could?

A much more positive approach would be to consider the spiritual and philosophical benefits that would result from such an exchange of knowledge leading to new respect and humility if we found that man was not alone in the universe. ■

WARC 79 WARC 79 WARC 79

## REPORT ALL INTRUDERS TO THE INTRUDER WATCH CO-ORDINATOR IN YOUR STATE

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# PREFERRED VALUES

Have you ever wondered why the values of components such as resistors, capacitors and even some inductances are given in what appear to be odd numbers such as 22, 47, 68 and so on? Actually the numbers are very carefully chosen, and are part of a system of what are called "preferred values."

Roy Hartkopf VK3AOH

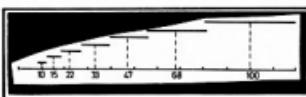


FIGURE 1: 20% preferred value series.

So the manufacturers of components decided to make a more logical system, where the next value began where the previous one stopped. With a 20 per cent tolerance the 10 value could vary from 8 to 12, so the next value was chosen as 15. The bottom value tolerance of this would be 12, which is the top tolerance of the 10 value. The top tolerance of the 15 value would be 18, so the next value chosen was 22, where the bottom tolerance would be 17.6 — very nearly the same as the top tolerance of the 15 value. And so the series goes on 10, 15, 22, 33, 47, 68, 100, and so continues always going up by the same ratios. If we want more accurate tolerances, say 10 per cent or 5 per cent then we have intermediate values based on the same principle.

The sketch above shows how the components with this new arrangement cover the full range without overlapping, and

they all have the same 20 per cent tolerance. Apart from avoiding the situation that was mentioned above, where a 90 value high tolerance component could be higher than a 100 value low tolerance component, there is the big advantage that instead of needing nine different values to cover the range we now only need six. This is particularly helpful where a firm is dealing with stocks of many thousands of components.

At first only resistors were available with preferred values but now almost all components have gone over to this system. By the way, some of you may have been puzzled by a coding on capacitors which has come out recently. You will see something like this — 332. What the little 2 or 3 or whatever means is that the value is in picofarads and the number — in this case 33 — is followed by two zeros. So the value in this case is 3300 picofarads or .0033 microfarads. In the same way 474 would be 470000 picofarads or .47 microfarad. It is as well to remember this coding as it will be used a lot in the future.

From Zero Beat, Dec. 77

In the early days of radio the values of components were given what might seem to be normal values, 10, 20, 30 and so on. But if we look at these values we see they are not very logical after all. If we look at the older series of values we see that the first two, 10 and 20 go up by 100 per cent. All resistors vary in actual value from their nominal value. The manufacturer builds to a tolerance, usually 5, 10 or 20 per cent. So with 20 per cent tolerance components there is a large gap — between 12 and 16 — where there is no value available. At the other end, 90 to 100, we find that a low value minus 20 per cent gives 80, while the 90 plus 20 per cent gives 108. So we have the silly situation where a low 100 value component can be lower than a 90 value component.

## COAXIAL CABLES AND CONNECTORS

The following article is reproduced from an old edition of the Westlakes Radio Club Monthly Newsletter. I have always found little facts like this interesting, and in some cases a knowledge of the significance of seemingly disjointed letters and numbers helps to fix them more firmly in the memory. I hope it will be of interest to readers.

tem designed to be compatible with a huge government parts stocking and numbering system. The letters don't mean anything themselves. "RG/U" always indicates a cable; and the corresponding "UG" a coaxial connector. The number in the designation refers only to the order in which cables were developed and then approved by the military. They have no relationship to the cable diameter or electrical characteristics.

Connector type designations have a more interesting story behind them. The UHF connector referred to its "ultra high frequency" operation. In the days of World War II, 200 MHz was ultra high frequency. But not for long. As engineers developed higher frequency systems the need for coaxial connectors with better performance arose.

Today's popular "N" type connector was developed by, and named after, a man in

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the Bell Laboratories named Neill. The "HN" type soon followed as a high voltage version of the "N".

The "C" type connector was named after its developer, Cal Concelman, an engineer at Amphenol RF Division and its predecessor companies.

As smaller cables into use, the "BNC" connector was developed jointly by Concelman and Neill. Hence the "N" and "C". The "B" comes from an old type "B" connector. No one knows what the "B" meant. The next logical step was to name the threaded version of the BNC the "TNC" and so on.

That was as far as the article went. I was particularly interested in the last paragraph. I have always (well ever since I first came across them) thought, since "T" meant threaded that the "B" stood for "bayonet". I wonder if any reader knows for sure?

### HOW THEY GOT THEIR NAMES

Did you ever wonder why the coaxial cable that you specified was called "RG/U", or the connector that goes with it was called a "BNC"?

The "RG" designations came about through a United States Navy coding sys-

# PRACTICAL HINTS

When replacing a transistor in an awkward position the job will be much easier if the leads are cut to different lengths. This allows you to insert one lead at a time instead of trying to get all three leads through the three holes at once. The leads projecting from the back of the board can be trimmed level after the transistor is soldered in place.



A neat and simple way of making taps on a coil is to make a loop in the wire and twist it. Finish the coil and then cut the end of the loop, clean the leads and solder the twist.



If you are looking for a former for large coils try a short piece of PVC conduit, the type electricians use. This is obtainable from about  $\frac{1}{2}$  in. to 2 in. For small coils the ideal thing is to keep a set of knitting needles. Wind the coil on them and

then slide it off. To make a neat job of a coil on a neosid or other  $\frac{1}{4}$  in. former wind it on a knitting needle of a slightly smaller diameter and then ease it on to the coil former.



If a receiver is giving very noisy reception you can check it by removing the aerial. If the noise continues then it is in the receiver but if the noise level drops it is being picked up by the aerial.



If a dial cord becomes loose on the pointer a drop of nail polish on the knot or connecting loop will fix it.



Aluminium can be soldered quite easily. Put a drop of engine oil on the spot to be soldered and then clean the aluminium under the oil with a sharp knife. Without removing the oil, tin the aluminium in the usual way. Use a large iron as the aluminium conducts heat very rapidly and it is hard to get the joint really hot.

Mechanical hum in equipment is usually caused by the transformer laminations vibrating. By tightening the screws which hold the transformer together this can often be eliminated.



Dial lamps in awkward positions which cannot be reached by hand can be removed by forcing a piece of sleeving over the bulb and using this to unscrew the bulb.



If you have some wire which is kinked and you want to get it straight, tie one end round a post or put it in a vice and put the other end until you feel the wire stretching slightly. It will then be perfectly straight.



By wrapping several turns of solder wire around the tip of one jaw of your long nose pliers you can strip insulation from wires without damage to the strands since the jaws cannot close completely and cut the wire.

## WHO TAKES CARE OF THE WATCHKEEPER'S DAUGHTER?

### A BRIEF HISTORY OF THE WIA INTRUDER WATCH

Allan Doble VK3AMG

Following the story of 21 years of intruder watching by the RSGB in "AR" for October, and the Federal President's QSP in the same issue, it seems an appropriate time to outline the history of our own WIA Intruder Watch.

The decision to initiate intruder watch action was taken by the Federal Council in 1967 during the presidency of Max Hull VK3ZS.

David Wardlaw VK3ADW was appointed Federal Co-ordinator, and set out recruiting a series of State groups.

The hundreds of hours of voluntary work put in by individuals since then is, like QSL Bureaux and other aspects of WIA activities, another story.

It will suffice to pay tribute here to the people who have been, or are doing the job up to the present time.

Every month, the co-ordinated reports from all States are arranged in order of frequency, and delivered by hand to the Radio Frequency Management Division of the P. and T. in Melbourne for study and action.

A copy is also sent to the headquarters of the IARU Monitoring Service in England.

#### IN THE FEDERAL FIELD

Co-ordinator — 1967 to 1971, David Wardlaw VK3ADW; 1971 to now, Alfred Chandler VK3XB, assisted by Ivor Stafford VK3XB.

#### BY DIVISIONS

VK1: 1974 to now, Ted Pearce VK1AOP; VK2: 1970 to 1974, Bill Jenvey VK2ZO;

1974 to now, Les Weldon VK2AFG, VK3; 1968 to 1969, Morton Davis VK3ANG; 1969 to 1971, Alf Chandler VK3LC; 1971 to 1975, Albert Cash (SWL); 1975 to now, Ivor Stafford VK3XB, VK4: 1970 to now, Murray McGregor VK4KX, VK5: 1971 to 1972, Bill Franzi VK5FR; 1972 to now, Leith Cotton VK5LG, VK6: 1973 to 1975, Ross Greenaway VK6DA; 1976, Albert Cash (SWL); 1976 to now, David Couch VK6WT, VK7: 1971 to 1972, Ian Pearson VK7KB; 1972 to now, Max Ivens VK7MX, VK8: 1975 to now, Henry Anderson VK8HA.

Note: From 1975 until now Alf Chandler VK3LC is also IARU Region 3 Co-ordinator.

Weekly schedules are kept with both the USA, Bill Conklin K6KA, and the UK, Stan Cook GB2IW, as well as with the VK4 co-ordinator, VK4KX.

# WIA PUBLICITY

open the door to...



The above 2 photos are copies of some of the WIA posters designed by Julie Scott, wife of Graeme VK3ZB.

These and other posters will be available for public displays by Divisions, etc.

RIGHT:

## Meet Your Executive

Left to Right: Bruce Bathols (VK3UV) observer, Graeme Scott (VK3ZB), Peter Wolfenden (VK3ZPA), Peter Dodd (VK3CIF, Secretary), David Wardlaw (VK3ADDW, President), Bill Roper (VK3ARZ), Ken Seddon (VK3AC5), Keith Roget (VK3YQ).

## HELP CLEAN UP OUR BANDS!!



Cartoons courtesy CB Australia.



# NIGHTOWLS MOPOKE CLUB

Bob Whitehead VK3NHA

We advise the formulation of a new club and associated awards for night owls.

Certificates are available for issuance at this time, bannerettes are currently being screen printed, and it is hoped that statuettes will be available shortly.

Costs have not been finalised but should not exceed a total of seven dollars.

There are four charter members at the moment, Bob VK3NHA, Trevor VK5NTB, Russel VK2NUN, and Garry VK7GM, with six more charter members being sought.

The current meeting place is novice 80m, any morning.

## INTERIM MOPOKE CLUB RULES

1. The purpose of the club and award is to further the use of the bands in the wee small hours, to ensure continuing contact and conviviality among club members and to provide some impetus and reward for aspiring night owls.
2. Qualification for initial and continuing active membership is:—
  - (a) thirty contact hours between 0100 and 0600 hours local time.  
(i) Contacts which have commenced prior to 0600 may continue to be counted up to 0700 local time.  
(ii) Where contact is between stations in differing time zones, the most advantageous 0600 to 0700 local time shall apply.
  - (b) To include at least two continuous four hour working periods (between 0100-0600/0700) with any station, or series of stations.
  - (c) Contact between 0100-0600 of at least one hour with a committee member.
  - (d) Any band, any mode legally permissible.
  - (e) For continuing active valid membership, a total of at least four hours per month between 0100-0600, subject to health or acceptable limitations.
3. Contacts are not limited to club members.
4. Membership is open to any country.
5. Net operation is permissible.
6. Neither QSL cards nor detailed logs are required, simply a list of contacts claimed showing date, duration in local time, band and mode.

7. Three contacts at random from the list supplied by the applicant will be checked in writing by a committee member.
8. The committee initially to consist of the ten charter members, thereafter the committee to be elected annually by simple majority of all members.
9. Club nets, competitions, awards and constitutional amendments to be decided upon by simple majority of members fulfilling the conditions of rule 2(e).
10. Other decisions affecting the club to be vested in the committee.
11. Contacts count as from 0100 local time July 1st, 1978.
12. Allocation of membership and awards may be effected by any one committee member after consultation with, and having the agreement of, the simple majority of current committee members.
13. The decisions of the committee shall be final and binding on all club members.
14. The basic award shall consist of:—
  - (a) Certificate, (b) Bannerette, (c) Mopoke statuette/key chain miniature.
15. Subsequent awards and/or endorsements as decided by consensus of members eligible under rule 2(e) to vote.
16. An inactive member may restore his or her voting rights at any time by fulfilling rule 2(e) for two consecutive months.
17. The club to be run on a non-profit basis, except that funds may be accrued against routine overheads and for such purposes as decided by the committee after seeking the views of all valid active members under rule 2(e).
18. Any funds at all times to be under the direct control of the committee.
19. A formal constitution to be adopted as soon as practicable.  
be final and binding on all club members.

Further information is available from Robert Whitehead (VK3NHA), Mopoke No. 1, 7 Spensley Street, Rosebud, Victoria 3939, Australia. Tel. (03) 059-86 4383 or (03) 509-88-6261. ■

# AMATEUR SATELLITES

Bob Arnold VK3ZBB

## OSCAR 8 PREDICTIONS

Thanks to Dick Smith Electronics for publishing the Orbital Data for OSCAR 8 as a supplement in the October edition of AR. This data will assist operators to track the satellite and no doubt improve many signals particularly on Mode J.

In the near future Dick will be publishing more basic data on OSCAR 7 and 8 which will fill in the gaps for newcomers. Keep your eyes on Dick's adverts.

## OPERATIONS

Due to publication deadlines, little time has passed since my last report and news is therefore scarce. As at the middle of October there is some doubt on the status of OSCAR on Mode B. This mode generally appears as per the BBA schedule and is being worked by a few stations in VK and ZL.

Information received via the AMSAT Pacific Net indicates that there could be a partial battery failure which is not totally unexpected after almost four years of operation. From time to time restricted use of Mode B is requested but it is not possible to convey this information via these notes due to the obvious time span between writing the notes and their publication.

To keep up to date with the status of OSCAR 7, there are two methods —

- (a) Listen to the CW messages on A07 beacons on 29.502, 145.972 or 435.1 MHz.
- (b) Listen to the AMSAT Pacific Net which is at 1100 GMT on Sundays on 14.280 MHz.

We all hope that OSCAR 7 is not following the same signs of failure that plagued AO6 prior to its demise. We will certainly miss the excellent communication facilities afforded by this satellite.

## AMSAT OSCAR 7 AND 8 DATA CALENDAR

In co-operation with AMSAT, Skip Reymann W6PAJ, expects to have available by the end of November an AMSAT-OSCAR ORBITAL PREDICTIONS calendar containing all orbits of the AMSAT-OSCAR 7 and 8 satellites for 1979.

The orbital calendar will be available post paid for \$5.00 US funds or 20 IRCS (\$3.00 to AMSAT members, and free on request to AMSAT Life Members). Overseas orders will be airmailed.

From outside the US, payment may be made by international postal money order or by cheques made out in US funds, or by US currency. Send orders to AMSAT or to:

Skip Reymann W6PAJ,  
PO Box 374, San Dimas,  
California 91773, USA.

Orders may also be charged to VISA or Master Charge. (Be sure to provide your

account number and expiration date on your charge card.)

IMPORTANT: To speed up handling of your order, please include a gummed, self-addressed label. Proceeds from the orbital calendar benefit AMSAT.

### PHASE 3 OSCAR

We understand from a report in "Ham Radio" that the following operational frequencies for Phase 3 OSCAR are now being determined —

Uplink 435.110 to 435.290 MHz

Downlink 145.810 to 145.990 MHz.

Beacons will operate on 145.805 and 145.995 MHz.

### GREETINGS

To all OSCAR operators, present and past — Christmas Greeting and good operating in 1979.

### ORBIT PREDICTIONS — JANUARY, 1979

#### OSCAR 7 OSCAR 8

Orbit Date	Orbit No.	EQX	EQX	Orbit No.	EQX	EQX
		No.	GMT		No.	GMT
			"W			"W
1	18120	0145	86	4203	0035	48
2	18132	0045	71	4217	0040	50
3	18145	0140	85	4231	0045	51
4	18157	0040	69	4245	0050	52
5	18169	0135	83	4259	0055	54
6	18182	0035	68	4273	0110	55
7	18195	0130	81	4287	0106	56
8	18207	0030	66	4301	0111	58
9	18220	0125	80	4315	0116	59
10	18232	0025	65	4329	0121	60
11	18245	0120	78	4343	0126	61
12	18257	0020	63	4357	0132	63
13	18270	0114	77	4371	0137	64
14	18282	0015	62	4385	0142	66
15	18295	0110	75	4398	0004	42
16	18307	0010	60	4412	0009	44
17	18320	0104	74	4426	0014	45
18	18332	0005	58	4440	0019	46
19	18345	0059	72	4454	0025	47
20	18358	0154	86	4468	0030	48
21	18370	0054	70	4482	0035	50
22	18383	0149	84	4496	0040	51
23	18395	0049	69	4510	0045	53
24	18408	0143	82	4524	0051	54
25	18420	0044	67	4538	0056	55
26	18433	0138	81	4552	0101	57
27	18445	0039	66	4566	0106	58
28	18458	0133	79	4580	0112	59
29	18470	0034	64	4594	0117	61
30	18483	0128	78	4608	0122	62
31	18495	0029	63	4622	0127	63

### QSP

#### 80/40 PETITION

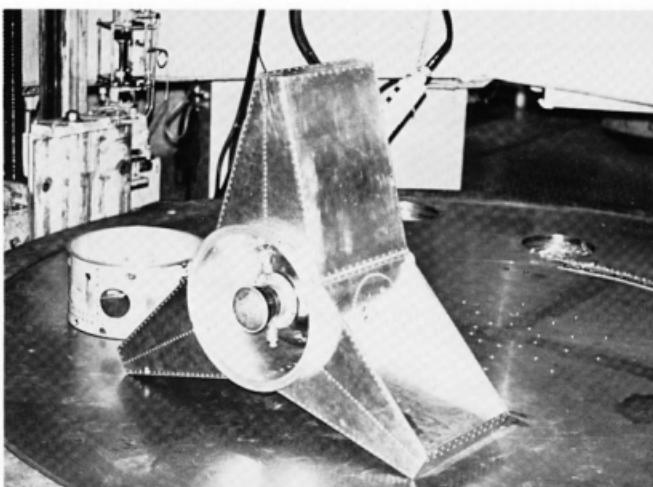
Some 415 amateurs signed the petition organised by Max Datsen VK2GE for extensions to the 80 metre and 40 metre bands to 3.8 MHz and 7.3 MHz respectively. Having regard to the closeness of WARC 79 the signed papers were passed to the Chairman of the APG Committee 2, so that he may use this interest in whatever manner is possible.

#### ARRL VIDEOCASSETTES

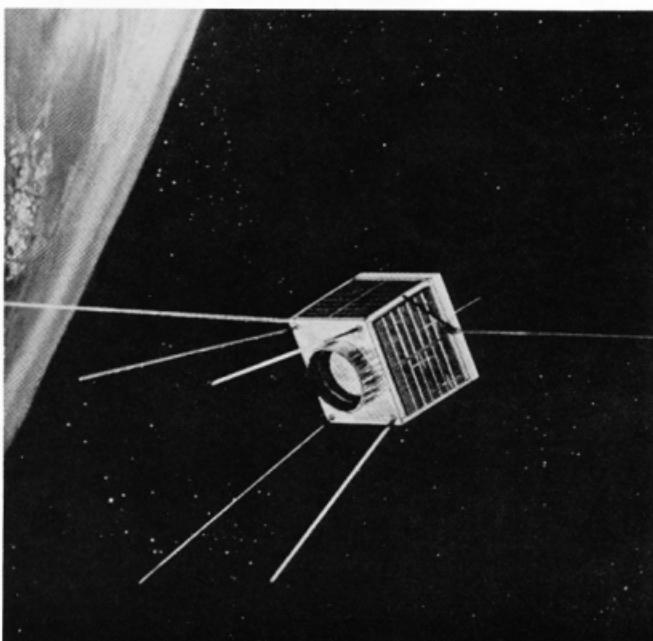
By now many amateurs in Australia will have viewed the ARRL films. It was interesting to read in Worldradio of August 1978 that the producer was Dave Bell WSAQ. Dave won an Emmy award in June as the executive producer of a documentary series on Science and Health, "Medix".

#### BC RADIO REPORTS

Sam Voron VK2BVS, reports that hourly amateur radio propagation reports are given over Radio 2GB, 870 kHz, following the weather report some four minutes past the hour. These begin after the midnight readings daily and is on a trial basis. Listeners' interest is sought via reports to the station to keep the reports going as an amateur PR function.



A prototype of Amsat Phase III satellite under test. The arms of the satellite carry the solar cells and in the centre is the "kick" rocket motor which will be used to send the satellite into elliptical orbit.—Acknowledgements to Amsat for this photo and descriptive article published in October AR.



An impression of Oscar 8 spacecraft in earth orbit by WASTUF — Amsat picture.

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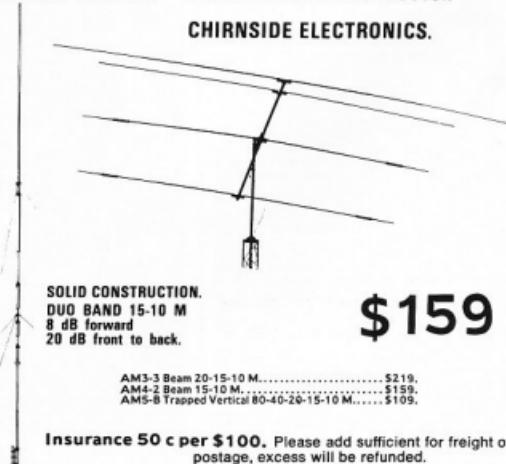


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8 dB forward  
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AM4-2 Beam 15-10 M.....\$159.  
AM5-8 Trapped Vertical 80-40-20-15-10 M.....\$109.

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Our shop is in a very suitable location and elegant environment. It is in reach of most Sydney customers. We have a large showroom and instant service available.

We do carry all TRIO KENWOOD SPARES. Parking is available at two large Council parking areas also, a rear loading dock also provided so please come up and visit us. Of course the LOFTS WAREHOUSE and service is continuing as usual. Mail orders may now be placed at either shop.

The new CROWS NEST address is SHOP 9 ROSE & MCLEOD PLAZA 477-479 PACIFIC HIGHWAY, CROWS NEST 2065 opposite the old CROWS NEST PICTURE THEATRE, easy walking distance from the W.I.A.

I hope to see you soon to see the latest from TRIO KENWOOD the world's largest manufacturer of Amateur equipment.

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PROPRIETOR.

TS-820	H.F. Transceiver	8 SP-70	Speaker for TX-700
TS-820S	H.F. Transceiver with DG-1	VFO-700S	Remote VFO for TS-700SP
DG-1	Digital Display	AT-200	Antenna Tuner
VFO-820	VFO for TS-820	TR-2200A	2 Metre FM Portable
VS-SP-820	Speaker for 820	VB-2200A	Power Booster for TR2200A
BS-8	Pan Display for TS820/820S	MB1A	Mtg. Bracket for 2200
DS-1A	DC Converter for TS820/820S	TR-7200	2 Metre FM Mobile
	TS520S	TR-7200G	2 Metre FM Mobile
YG-88C	Crystal Filter	VFO-30G	VFO for TR-7200
FR-820	Communications Receiver		Crystals for TR-2200
YG-88A	AM Crystal Filter for R800	TR-7010	and 7200 (Pair)
YG-445C	C.W. Crystal Filter for R820 (500 Hz)	TR-3200	2 Metre SSB Mobile
YG-445CN	Narrow C.W. Crystal Filter for R820 (250 Hz)	TR-7400A	70 cm FM Portable
TS-520S	H.F. Transceiver	TR-7500	2 Metre Digital Mobile (100 Ch 25W)
VFO-520S	VFO for TS-520S		2 Metre Transceiver (100 Ch 10W)
Q-520	Speaker for 520	RS-6	AC Power Supply for TR-7500
YG-3395C	Crystal Filter	PS-8	AC Power Supply for TR-7400A
BS-5	Pan Display for TS520/TS520S	Q-R-300	Communications Receiver
DG-5	Digital Display and Frequency Counter	MC-50 *	Desk Microphone 500
DK-520	Digital Adaptor Kit (connects old TS-520 to DG5)	MC-10 *	Hand Microphone 50K
TV-502S	2 m Transverter for 520 & 820	MC-35S *	Hand Microphone 50K
TV-506	6 m Transverter for 520 & 820	HC-2 *	Ham Clock
TS-600	6 Metre all Mode Transceiver	MC-30S *	Hand Microphone 500
TS-700	2 Metre all Mode Transceiver	HS-5 *	Headphones
TS-700S	2 Metre all Mode Transceiver	HS-4 *	Headphones
TS-700SP	2 Metre all Mode Transceiver	LF-30A	Low pass Filter
VOX-3	VOX Unit for TS-700	SM-220	Station Monitor
		TL-922	Linear Amplifier (2kW PEP)



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## 2m FM POCKET TRANSCEIVER

### SPECIFICATIONS:

Transceive Frequency Range: 2 MHz in 144-148 MHz;  
 Transceive Channels: 6 Channels; Mode of Operation: FM;  
 Antenna Impedance: 50 Ohms unbalanced, BNC connector;  
 Power Requirement: 12V DC (Negative Grounded);  
 Power Consumption: Transmit 300 mA, Receive 100 mA,  
 Stand-by 25 mA; Weight: 1.03 lbs. (470g); Repetitor Offset:  
 ± 600 kHz; Modulation: Variable Reactance phase  
 modulation; Max. Deviation: ± 5 kHz; Microphone:  
 Condenser Microphone; Receiver: Double conversion  
 superheterodyne (1st IF = 16.9 MHz, 2nd IF 455 kHz);  
 Sensitivity: -4 dBu (NO 20 dB); Audio Output:  
 Maximum 0.3 Watts; Attachment: Rubber ducky  
 antenna, Nicad battery pack, DC cable with  
 cigarette lighter plug. Carrying strap.



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Featuring a 220 MHz counter upper limit and 30 MHz generator  
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- ALC circuit to prevent overloading
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## TRANSCEIVERS:

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FT301 ..... \$930

FT301D ..... \$1090

FP301 ..... \$175

TRIO KENWOOD: TS520S ..... P.O.A.  
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 TS820S ..... P.O.A.

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- Digital display system (using a large-sized LED) provides reading up to six figures

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- 144 - 148 MHz, PLL digital synthesizer system (800 channels)
- A large-sized LED, digital display system provides readings up to six figures
- Easy-operating separate and selective mechanism displayed by the frequency unit for wider operation
- Transmitting output: 25W/1W, two-step selector switch



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A Microprocessor controlled, stand alone, keyboard that generates Morse, RTTY and ASCII codes.

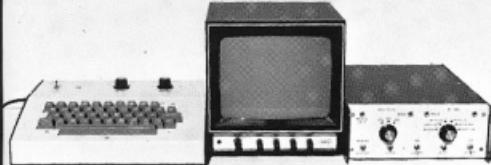
#### NEW INFO-TECH RTTY EQUIPMENT:

Model 75 RTTY to Video Converter

\$448

Model 150 RTTY Keyboard

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### RF PREAMPLIFIERS FOR 3-30 MHz BAND:

Model SX-59 for use with transceivers.

#### SPECIFICATIONS:

Frequency range 3.30 MHz in 3 bands: 3-7, 7-14, 14-30 MHz  
Gain 20 dB nom. (at 7 MHz), front panel variable control  
Attenuator — 20 dB attenuation selectable from front panel control.  
Imped. 50 or 75 ohm systems, UHF connectors on rear panel



\$86

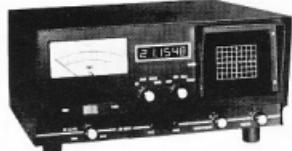
### Order Your ROBOT Model 400 SSTV CONVERTER NOW!!



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With the Robot 400 you just plug it into your transceiver, connect a TV monitor or your home set with the optional Robot RF adapter kit, tune to 14.230, and you're operating SSTV.

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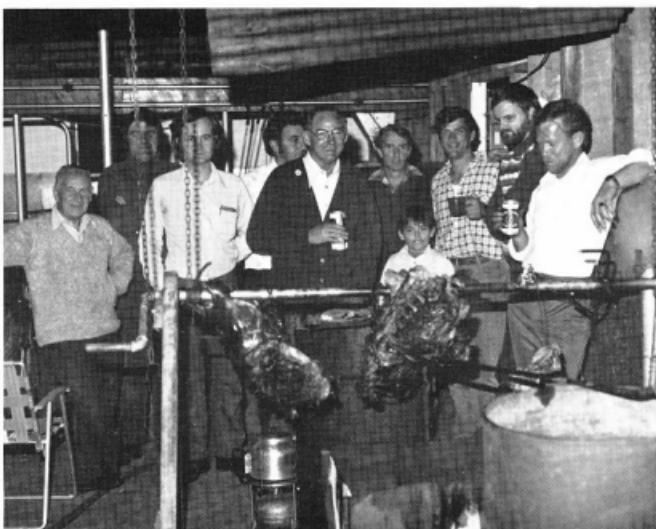
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**B&W DUMMY LOADS-POWER METERS**  
Model 334 - 1500W - Oil Cooled \$199  
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# EASTERN ZONE BARBECUE

The East Gippsland Group of the Victorian Eastern Zone held a barbecue supplied by Ian VK3BLF and his XYL, Glenys, on their property at Tambo Upper. Among the 50 attending were those pictured — left to right: an SWL, Ian Pattle VK3ZIS, Warren Wright VK3AVZ, VK3 NLM, Jim Watts

VK3NFQ, VK3BBB, Graeme Brown VK3ZXG, Michael McDonald VK3ZQV and Ian Foster VK3BLF (photo courtesy Gavin Kuch VK3ZNC/VK3NIC). The 100 lb. pig disappeared rather smartly as the second photo shows Graeme Brown and mine host, Ian Foster, dismantling the carcase.



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# VHF-UHF

## AN EXPANDING WORLD

Eric Jamieson, VK5LP  
Forreston, 5233

### AMATEUR BAND BEACONS

VK0	VKOMA, Mawson	53.100
VK1	VK1RTA, Canberra	144.475
VK2	VK2WI, Sydney	52.450
VK3	VK2WI, Sydney	144.010
VK3	VK3RTG, Mittagong	144.120
VK4	VK4RTL, Tumut	52.445
VK4	VK4RTT, Mt. Mowbullan	144.495
VK5	VK5RBB, Brisbane	432.475
VK5	VK5RT, Mount Lofty	53.05
VK6	VK5RTV, Mount Lofty	144.800
VK6	VK5RTV, Perth	82.300
VK6	VK5RTU, Kalgoorlie	52.355
VK6	VK5RTW, Albany	52.950
VK6	VK5RTW, Albany	144.500
VK6	VK5RTV, Perth	145.000
VK7	VK7RTN, Launceston	52.400
VK7	VK7RTX, Ulverstone	144.900
VK7	VK7RTW, Ulverstone	432.475
VK8	VK8FV, Darwin	52.200
JA	JA1GJY, Nagoya	52.500
KG6	KG6DX, Guam	50.110
KH6	KH6EQI, Hawaii	50.104
TI	TI2NA, Costa Rica	50.080
W	WA5JRA, Los Angeles, USA	50.091
ZL1	ZL1VHF, Auckland	145.100
ZL1	ZL1VHF, Walkaloa	145.152
ZL2	ZL2VHF, Palmerston North	52.500
ZL2	ZL2VHF, Wellington	145.200
ZL3	ZL3VHF, Palmerston North	145.250
ZL4	ZL4VHF, Dunedin	145.400

\* Denotes re-inclusion in list.

Well, it shows it is possible to get action and confirmation. Last August I removed the VK0 beacon from listing as no confirmation existed at the time as to whether it was operating. I have now received a letter from Keith Gookey VK2BGZ of the Ionospheric Prediction Service stating the Mawson beacon is definitely operating with 80 watts output on MCW to a 3 element yagi horizontally polarised. The IPS asks for reports and should be sent to the current operator, Mr. Graham Setton, Ionospheric Prediction Service, PO Box 702, Darlinghurst, NSW, 2010. Graham will be returning to Australia in early 1979. Thank you, Keith, for the information, there will be many people pleased to know the beacon is still running, and hope facilities exist for two way contacts if the beacon is heard.

Advice has also been received from the NSW VHF and TV Group to the effect that the Mittagong beacon VK2RHR on 2 metres has been discontinued as the site is now to be used for a repeater.

My thanks to David VK5SK for preparing the VHF notes for November issue due to my absence on leave in Western Australia. I haven't seen what he wrote, yet I know they will be interesting. For my part, I met Tony VK6BY in Kalgoorlie and spent an interesting evening with him. He has a brother, Tony, 500 miles closer to Perth, and his address is care of Box No. 430, At Albany I met Aub VK6XW, Wally VK6WG, Bernie VK6JK and Bob VK6SE, all of Albany, and Doug VK6DQ from Kalgoorlie. Talk, of course, was VHF orientated naturally, and whilst we did not come up with many new things, at least it was an interesting exchange of information, and gave me the chance to meet the guys at the other end of the 52, 144 and 432 MHz contacts I have had to Albany.

Took my FT221 and magnetic base roof mounted 1/4 wave whip antenna with me, and had a number of contacts through various repeaters at different points on route. Most pleasing however was the opportunity presented on the day we left Albany to work Aub VK6XW, mobile while en route to the

Stirling Range National Park, 80 km away, with contact on Channel 49 being maintained all the way! A sked was arranged whilst stationary in the Stirling Range, that night on 144.010 SSB. First contact was with Aub at 54-5 with alias OSB. Stronger signals would no doubt have resulted had Aub been able to get his horizontal beam around on to me, but the antenna had been damaged during the "big blow" just previously, so we had to be content with a tips-on contact.

Thanks, Aub, for your hospitality during the two days of my visit, and for arranging an opportunity to meet the other boys at your house. I left Albany with the news that I would be back again sometime, hopefully with a few more days to spend than were available this time.

Joe VK7-G writes enclosing a copy of a reply he sent to Electronics Australia regarding their editorial in September issue re Ch. 5A and I concur with his comments. His letter may be printed in the said publication in which case you will want to read it.

Joe goes on to say that activity in Launceston is increasing with Daniel VK7DA modifying an FL2100B for use on 6 metres. Kevin VK7DA now runs a 4CX350 on 2 metres, and 100 watts on 432. Joe is using a 4CX250B in groundless grid to give 150 watts output on 2 metres, and should by now be capable of using the legal limit on 6 metres to a pair of 5 over 5 yagis.

A letter is to hand from SWFEX in Hong Kong who advises working 162 JAs and 5 KH6s from beginning of May.. He uses a TS600 and a 120 watt amplifier with an 8 dBi collinear vertical antenna 400 feet a.s.t. He is currently keeping an eye on 50.100 each Saturday and Sunday from 1000 to 1200Z. Thanks for writing, Klaus.

Bruce Beresford P288BB writes from Yonki, PNG, to say that QTH is in the Eastern Highlands Province of PNG, 25 km east of Kainantu, 200 km from Lae and 116 km from Goroka, and 1400 metres a.s.t. He is using a Q860/40 linear on 6 metres to a 5 el. yagi. He has an 8 element on 2 metres and a linear on the way. A log periodic antenna for 6 to 250 MHz is used to keep an eye on TV OK.

On 10-8-78 he worked on 50.110 KA2MM, KG6JH, KG6DX, KG6JIP, KG6JIO and JH4KAY. On 50.058 J1R1MD and 52.193 JH7JHM. The KH6EQI beacon was 57.000 to 57.005 with JA1. 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# AROUND THE TRADE

with only JA5 and JA0 areas missing. 10-9: 1140 to 1333 30 contacts on 52.050 VK8ZCV, JR1, JJ1, JF1, KG6, JA7, JH0, JA5, JH4, JH6, JK1, JH7, JE2, JA3, JR6, JG1, JE3, JF3, JH2, JH1, JA1, 11-9: 1043 to 1238 16 contacts 52.050 JR6, JA5, JE3, JH6, JA5, JA9, JA1, JR2, JH4, JA0, JA7, KG6, JF3, P29BB and KG6RO on Salpan. On 144.110, 1118 to 11352 JH4XTN, JAGABG, JH6FEY, JRA4JW, JH4RSP and JH6TEW.

"12-9: 1140 JA4HI and JR6AGZ both on 144.110, 13-9: 13002 52.050 JA2HMO, JH4: 1104 to 12402 52.050 KG6, JH6, JA2, JK1, JE3, JF3, JA3, JH7, JE1, JF1 to 13 contacts on 144.110 1118 JH6TEW, 1123 JH6PO, 15-9: 1055 to 1255Z 19 contacts 52.050 KG6, JH6, JH5, JA2, HJ2WL, JH2, JE2, JR3, JF3, JJ1, JA3, JH4, JE3 On 144.110 1102 to 1119Z JH6TEW, JR8KUZ, JASAFU and JH6CTV, 16-9: 1057 to 1217Z 18 contacts JA2, JH4, JH5, JF3, JA2, JE3, JE1, JR2, JG3, JA4, JA5/J5, JA6, JH7, JA9, JH6, 1104 to 1138Z 144.110 JH4PO, 144.291 JASVUT, JR6AWT, JR6AD, JH6AD, JRBNNO, 144.150 JH6CJ, JH6CPH, 17-9: 1140 to 1159 52.050 VK8ZCU, JH4EVU, JA2DDON, JH6TEW, 144.110 JA6LDR, 18-9: 1057 to 1217Z 144.110 JABOFR, 1102 to 1202Z, 18-9: 1057 to 1217Z 52.050 23 contacts JA2, JH4, JA6, JA4, JH6, JR2, JG3, JE1, JA5, JE6, JA9, JA0, JE2, JH2, JF3, JH6, KG6, P29BB, 19-9: 1255 to 1340Z 8 contacts 52.050 JH3, JH1, JK1, JF3, JE1, JF1, JH1 and JG1.

"As you can see, six metres is very good and two metres even better. JA, JA0, even day since -9-9 though I haven't worked stations every day, so for JA0 I have worked all VK Stations except VK7 on a number of occasions, some openings evening TEP extended by Es.

"KG6RO (Salpan) is on six regularly. The SMIRK DX-pedition left their gear behind and the licensed Ryau runs a keyer on 50.110 on an extended basis. His beam is fixed on JA and he has only a little English understanding.

"FOBDR Renn in Tahiti is back on air. He worked JA1 16-9 6430Z on 50.110, and runs a keyer on an extended basis on that frequency. SB4CY is a beacon on Cypress on 50.500. They have not got any permission to have any six metre contacts though (HL9W Info). ZB2WVF is a beacon on 50.003 on Gibraltar. ZS8PWP beacon is on 50.030. ZS8BWH beacon is on 50.100. These three items from SMIRK newsletter.

"Following is a summary of known active stations on six metres in the Pacific area, and all should be workable from Australia. We have 12 countries worked and 10 confirmed. HL5WI works WABJRA on 28.520 2200 to 2300Z on Saturdays and Sundays.

- 1. JA
- 2. JDI Minami Torishima.
- 3. JD1 Willis Island.
- 4. KG6 Guam.
- 5. KG6RO Salpan.
- 6. KC8ST Eastern Caroline Is.
- 7. KB8 Hawaii.
- 8. VK9ZM Willis Island.
- 9. YJ8JKM New Hebrides.
- 10. ZS8CNC Fiji.
- 11. K9PNT/DU2 WB5LBJ/DU6 Philippines.
- 12. P29
- 13. VS8FX Hong Kong.
- 14. CR8AJ Macao.
- 15. ZL.
- 16. VK9NI Norfolk Island (?)
- 17. FK9AB New Caledonia.
- 18. FOBDR Tahiti.

So there you have the good news. Add to this the 48 MHz peak shown in the IPS Charts for October compared with 34 MHz last year and that means six metre DX.

Bill VK9ZM on Willis Island will be leaving about 5-12-78, but it is probable you will have worked him prior to these notes. He knows to listen on 52.050 and 144.110, runs 25 watts to a 5 element yagi on six and 100 watts to a pair of vertical yagis on two metres, plus a 10 element yagi. Apparently he has already had contacts with amateurs in Townsville and Ingham on FM and SSB. Before leaving it is anticipated he will be operational on 432 MHz as well. A good contact looming up. Graham VK6GB in a late note says Bill VK9ZM worked KG6JGB on 20-9 and 21-9 for first 6 metre contact, so that should set Bill into the right mood!

December, of course, normally sees the start of the Ross Hull Contest, and I would expect it to be on again this year. However it is to be

hoped a more equitable set of rules can be used than has been the case for the past three years, rules which give no incentive to work more than one band. There seems little doubt the contest helps to bring stations on the air but it is difficult to obtain a reasonable return of logs for the Contest Manager. Some operators are probably swayed by the high score a few stations make on other bands can be incorporated in the contest for workings by stations in other ways, in addition to highest score etc. Above all, let's try and keep the contest going, and please send in a log, several hundred stations annually enter the contest and give numbers, but only a handful enter logs.

December is also Christmas month, and I would like to pass on the compliments of the season to everyone, and may we hope for a happier year in 1979, and at least some decent treatment from WARC 79. May another New Year wish be that we obtain the use of 50 to 52 MHz. If you have any comments in regard to my article on the six metre band, just published, please write.

I now enter my tenth year as your scribe for this section, I hope I have been able to give you something worth reading from time to time. The task is not easy, and I thank all the stations and DXers from whom I receive letters, writers the task is that much easier. Again my special thanks to Graham VK6GB for the large amount of time he spends sending me such a complete cover of information from Darwin.

Closing with the thought for the month: "Too many people work themselves into a lather with soft-soap."

73, The Voice in the Hills. ■

## FROM THE OVERSEAS ADS.

An occasional AR feature

Palomar PTR130K — New miniature HF transceiver. Digital readout with push button frequency selection and tuning. Covers all HF bands and has a synthesizer with 100 Hertz steps.

One major Japanese manufacturer, NEC, has an interesting line of gear which is little seen in Australia. They have a digital readout transceiver, the CQ110, which has been on limited sale. As a companion unit they have the CG301 linear amplifier, which covers 160-10 metres and uses a pair of 3-500Z grounded grid triodes.

Yeesu have the FTV901, a three band 50, 144, 432 MHz transverter, as a new accessory for their FT901 transceiver.

Datong in the USA have released their FL1 frequency agile audio filter. This filter can scan the audio spectrum and then lock on to a heterodyne and either peak or reject it. ■

## EDITOR'S HEADACHE

### EDITOR'S HEADACHE

Getting out a magazine is no picnic. If we print jokes, people say we are silly. If we don't, they say we are too serious. If we don't print contributions, we don't appreciate genius, and if we do print them, the magazine is filled with junk. If we clip things from other magazines, we are too lazy to write them ourselves. If we don't, we are stuck with our own stuff.

Now, like as not, some guys will say we swiped this from some magazine. That's right, . . . we did. ■

\* From a well-known journal, which did not mention the source, either. ■

Hewlett-Packard have announced the production of a new Gallium-Arsenide FET, the HFET-1102 for the range 1-12 GHz. A minimum gain of 11 dB and a maximum noise figure of 1.7 dB are specified at 4 GHz. The company has also announced a new bipolar transistor, the HXTR-5102, capable of more than 0.5 watt output at 4 GHz with 0.1 watt input. It would be suitable for SSB transmitter service.

### SATELLITE AND RF TELEMETRY RECEIVERS

Microdyne Corporation, represented in Papua-New Guinea, New Zealand and Australia by Scalar Distributors Pty. Ltd., manufactures receivers and related equipment for RF telemetry, meteorological and communications satellites, aerospace research and satellite television use throughout the world.

The main product line consists of receivers, diversity combiners, precision signal generators and predection tape recording converters. Microdyne also markets complete television satellite earth terminal systems and receivers.

The main receiver is the 1100 series, having the capability of achieving great versatility through totally co-ordinated modular design.

By changing a few appropriate plug-in modules, just one basic receiver chassis is needed to process data and to provide antenna tracking information for all of the following programs: Landsat USB, VHRR, AVHRR, Meteosat, Nimbus-G, Seasat B, Stretched VISSR, DMSP, MDS-FWAX and MDS-FT, plus all IRIG telemetry data link formats. The latter include such programs as Harpoon, Cruise Missile, Polaris, Trident, F14, F16, F10, AWACS, Natco-5 MRCA, Space Shuttle and many others.

Due to the wide variety of plug-in modules available, it is likely that any new satellite or other RF system requiring a configuration not already listed can be readily accommodated at minimum cost including FDM and single channel per carrier satellite communications receivers.

Further information may be obtained from Scalar Distributors Pty. Ltd., PO Box 48, Kilsyth, Victoria 3137. ■



BWD Power Scope (see AR, November)

## QSP

### SPECTRUM

"Spectrum supply is getting short. A single frequency is worth so much money that it is difficult to set a dollar value on it. The frequencies allocated to amateurs are worth a King's ransom and then some." Quote from a WARC article in July 1978 "Worldradio". ■

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Star Features:

- Solid State Coverage 1.8-30 MHz.
- Solid State Coverage 100 kHz-30 MHz.
- Receive Coverage 100 kHz-30 MHz.
- True 100 Hz Frequency Synthesizer with 5 kHz Reference (does NOT use D-A Converters as some other rigs claiming 100 Hz synthesis).
- 6 Digit Frequency Readout.
- Digital Readout of Signal Strength in dB Above the Noise Floor of Receiver.
- RF Compressor Effectively Increases Transmitter Output by 12 dB (16 times).
- Approx. 20 watts output.
- Modes: LSB, USB, CW, AM, FM.
- Superior Receive Selectivity — Typical Shape Factor 3 dB/60 dB 1.25 (2 Cascaded Collins Mechanical Filters).



- Diode Ring Mixer with Broadband Load to Optimum Intermodulation
- 400 Hz CW Filter.
- Size: 6 1/2" x 2 1/2" x 8".
- 58 ICs, including 7 LSI Circuits.
- Watch this space next month for price.

P.O.A.

## SL-55 AUDIO ACTIVE NOTCH FILTER DESIGNED FOR THE FT101E

Here is the Receiver Audio Active Filter that makes all others obsolete. The Electronic Research Corporation America Model SL-55 Audio Active Filter adds unequalled versatility in receiver audio processing for SSB and CW. This filter was designed, produced and made available to the amateur community only after painstaking research and field testing of its effectiveness in minimizing QRM. Check these features:

Continuously tunable bandpass filter (not lowpass) so that the passband can be positioned anywhere from 200 to 1400 Hz. 28 dB bandwidth is continuously adjustable from 14 to greater than 2100 Hz (22 dB bandwidth from 140 to 2100 Hz).

Audio input and output impedance is eight ohms with one watt output power at 1000 Hz.

Dimensions: 5.5 x 7.5 x 2.5 inches.

Available in grey to match FT101E.



\$129

Positioning of simultaneous notch filter is continuously variable from 300 to 1400 Hz with FINE and COARSE position controls. Notch depth is fixed at nominally 30 dB. Notch filter is independent of bandpass tuning and may be completely disabled. Bypass switch restores the receiver audio output path to its original configuration. Power Requirements: 240V AC at less than 1/16 amp. No batteries needed.

BAY CITY ELECTRONICS PTY. LTD.

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BANKCARD WELCOME

# FT-225RD



## 2 Meter All Mode DIGITAL READOUT TRANSCEIVER

### Features

#### ■ Full Coverage

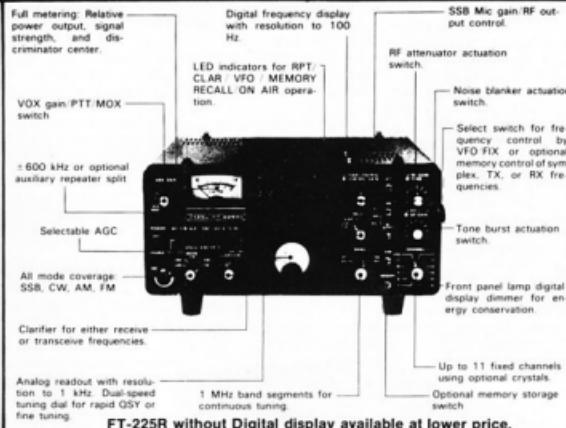
The FT-225RD provides operation on all modes — SSB, CW, AM, and FM — over the entire 4 MHz of the 2 meter band.

#### ■ PLL Circuitry

The local oscillator employs the modern Phase Locked Loop (PLL) technique, with its fundamental oscillating in the 130 MHz range. This effectively eliminates spurious radiation and yields a clean output signal. On receive, the PLL likewise rejects unwanted out-of-band interference.

#### ■ Frequency Memory Option

Following the design philosophy pioneered in the FT-901DM HF transceiver, an available option for the FT-225RD is a memory unit which allows storage and recall of any frequency within the range of the transceiver. This circuitry allows



FT-225R without Digital display available at lower price.

instant, programmable QSY to a favorite repeater or calling frequency with only a flick of a switch.

#### ■ Digital Plus Analog Frequency Readout

The digital display uses large, bright LED's for maximum readability, with resolution to 0.1 kHz. The front panel lights and display may be dimmed, too, for nighttime mobile operation.

#### ■ Versatility Features

Squelch, VOX, PTT, semi-break-in CW with sidetone, and tone burst are standard features on the FT-225RD. A superb noise blanker permits mobile SSB operation, and a discriminator center meter allows precise zeroing of FM signals. The clarifier produces  $\pm 3.5$  kHz offset of either the receive or transceive frequency during VFO, memory, or fixed channel operation.

Our years of handling and specializing in this equipment have enabled us to build up a fund of knowledge and technical experience, backed by a comprehensive range of spare parts and service facilities. We don't just sell a set, our concern extends throughout the life of your equipment.

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FEATURES EXTENDED COVERAGE FOR OSCAR 8

This 432 solid state linear transverter is intended for use with a 144 MHz transceiver to produce a high reliability transceiver capability. A 10 watt load and RF sensing network eliminates the need for any ancillary circuitry. A single coaxial connection is all that is required between the transverter and the associated 144 MHz transceiver.

A wide range of applications is offered by the MMT432/114 transverter, which by virtue of its linear mode of operation will enable 144 MHz SSB, FM, AM or CW equipment to be used at 432 MHz. to 436 MHz.

Simply connect direct to your 2 metre rig, 12 volt supply, fit 70 cm antenna for instant SSB, FM, AM, CW operation, coverage 432-434/434-436 in two ranges.

FEATURES: High quality double-sided glass fibre printed board \* Highly stable zener controlled oscillator stages \* PIN diode aerial changeover relay with less than 0.2 dB through loss \* Extremely low noise receive converter, typical 3 dB \* Separate receive converter output gives independent receiver facility \* Built in Automatic RF VOX with override facility \* Built in 10 watt 144 MHz termination, selectable attenuator for 1/2 watt \* Use of the latest state of the art Power Amplifier transistors provide reliable 10 watts continuous output

MODEL MMT432/144'S' Price \$295



# Transverter Model MMT 432/28'S'

FEATURES EXTENDED COVERAGE FOR OSCAR 8

Second Crystal Oscillator gives two ranges: Low 432 - 434 MHz - High 434 - 436 MHz. Programming available to either Transmit/Receive both Low, both High, or a mixture of the two. Adjustable Drive Level is now provided by an input potentiometer. Optional RF VOX. Power Output 10 watts minimum \* 28 MHz IF \* Drive 1 mW to 500 mW \* Aerial Changeover by PIN diode switch \* Modern Microstrip Techniques \* Power requirements 12 volt nominal at 150 mA 2.5 amp. peak \* Case size 187 x 120 x 53 mm \* Spare 432 input socket.

MODEL MMT 432/28'S'

Price: \$245

Price: \$185



## DUAL RANGE 432 - 434 MHz & 434 - 436 MHz CONVERTER

TYPE: MMC 432/28'S' & MMC 432/144'S'

FEATURES:

- Extra Range (434-436 MHz) For Satellite Reception
- Ultra Low-Noise First RF Amplifier Stage
- Highly Stable Zener Diode Controlled Crystal Oscillator and Multiplier Stages

### SPECIFICATIONS:

Input frequency ranges:	432-434 MHz (low) 434-436 MHz (high)
I.F. output frequency:	28-30 MHz or 144.146 MHz
Typical gain:	30dB
Noise figure:	3dB Maximum
D.C. Power requirements:	11-13.8 volts
Current consumption:	12.5V nominal 50 mA Maximum

Price: \$67.00



BNC CONNECTORS - Excellent quality, fully imported from U.K. - U.S. Mil. No. UG88E/U. Price: \$1.35 each.

## NEW READY-TO-OPERATE MODULES AVAILABLE IN THE SALES PROGRAM OF VHF COMMUNICATIONS.

All modules are enclosed in black cast-aluminium cases of 13cm by 6cm by 13cm and are fitted with BNC connectors. Input and output impedance is 50 ohms. Completely professional technology, manufacture, and alignment. Extremely suitable for operation via satellite or for normal VHF/UHF communications.

### 6 METRE MOSFET CONVERTER

Featuring 24 MHz local oscillator output for transverter use:

Input frequency:	52-54 MHz
I.F. Output Frequency:	20-30 MHz
Typical Gain:	30 dB
Noise Figure:	2.5 dB
Typical Image rejectoin:	65 dB
Crystal Oscillator Frequency:	24 MHz
Power requirements:	12 volt ± 25% at 35 mA.

MODEL MMC52/28LO Price: \$49.00

CONVERTERS PACK & POST \$2.00

### 1296 MHz CONVERTER

Microwave module, Schottky diode mixer.
IF: 28-30 MHz or 144.146 MHz
Noise figure: typ. 8.5 dB
Overall gain 25 dB
Power Requirements: 12 volts DC ± 25% at 50 mA.
Price: \$65.00
500 MHz COUNTER Model MMD050/500
Price \$175

AMATEUR ELECTRONIC IMPORTS IS THE EXCLUSIVE AUSTRALIAN DISTRIBUTORS FOR THESE PRECISION BRITISH MADE UNITS FROM MICROWAVE MODULES LTD.

### 144 MHz MOSFET CONVERTER

Noise figure: typ. 2.8 dB.
Overall gain: typ. 30 dB
IF: 28-30 MHz, 9.15 V 20 mA.
Price: \$45.00
VARACTOR TRIPLER 432/1296
Max. input at 432 MHz, 24 W (FM, CW)
- 12 W (AM)
Max output at 1296 MHz: 14 W
Price: \$74.00

All prices subject to change without notice. Onwards forwarding please add sufficient for freight or postage. Excess will be refunded.

# Amateur Electronic Imports

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CABLE: "AMATEURIMPORT, SYDNEY"

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TS520S	\$89 Deposit
ICOM IC701	\$169 Deposit

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121 NERANG STREET, SOUTHPORT, QUEENSLAND 4215  
(Opp. Southport Hospital) Telephone: (075) 32 2644

## FANCY WINNING A TS 520S

FOR \$1.00?

### SOUTH-EAST RADIO GROUP LOTTERY

1st Prize — KENWOOD TS 520 S	Value \$789.00
2nd Prize — KENWOOD R 300 RECEIVER	Value \$260.00
3rd Prize — KENWOOD MC 50 DESK MIC.	Value \$58.00
4th Prize — KENWOOD HC 2 WORLD CLOCK	Value \$34.00

6000 TICKETS — \$1.00 EACH

DRAWN 22nd DECEMBER, 1978

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If you would like to be part of this Lottery, write for details to:

Lottery Committee, S.E.R.G.  
P.O. Box 1103,  
Mt. Gambier, S.A. 5290

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SOUTH-EAST RADIO GROUP BUILDING FUND  
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Results published in the Adelaide "Advertiser" 26th December, '78.

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HONG KONG

# WICEN

Ron Henderson VK1RH  
Federal WICEN Co-ordinator,  
53 Hannaford St, Page ACT 2614  
Ph. (062) 54 2059, A.H.

In this December issue of AR I believe it is time to review the aims of WICEN.

## BACKGROUND

The Wireless Institute Civil Emergency Network, or WICEN for short, has its origins in the various State civil emergency networks set up by amateurs after World War II. In the late fifties and early sixties amateur communications were superior, relatively speaking, to those of the civil agencies and much good work was done in flood and bushfire disaster situations. In the early seventies, with improved civilian communications, including the extensive use of VHF FM and STD the demands for WICEN fell and many authorities saw no role for the amateur. However, happenings over the recent years have disproved this view and shown the organised amateur communications still have a place in emergency plans.

## THE CHALLENGE

But what must we as amateurs and active WICEN members do to meet this challenge?

We must be trained and organised for our role, for the mission of WICEN is to provide a pool of trained licensed operators with equipment, available for deployment to aid communications in an emergency.

To achieve this state of preparedness we must:

- register with our State, regional or district WICEN committee to indicate our availability,
- attend WICEN training courses to gain an understanding of working with civilian agencies, in particular SES,
- attend WICEN exercises regularly to keep our knowledge and skills up to date.

Your WICEN committees will maintain liaison with civil authorities and endeavour to conduct training courses and exercises, often in conjunction with civic activities in order to make use of the live traffic situations and gain valuable public exposure of our capabilities.

## RESERVATIONS

A final word of warning, directed primarily to WICEN committees, take care in offering communications to "everyone and his friend". It's not within the regulations and is taxing on resources. Don't forget the SES communications sections are always on the lookout for good men if you are so inclined. Remember the golden rule of Amateur Radio, "The Amateur is Balanced . . . Radio is his hobby. He never allows it to interfere with any of the duties he owes to his home, his job, his school, or his community". (ARRL Handbook.)

WICEN is but one aspect of amateur radio, together with VHF DX, Oscar, RTTY, SSTV, Repeaters, VHF DX, and novice classes to name some of the competing interests before you even start on the garden!

Next issue, some thoughts on WICEN training courses. ■

contacts with almost all European countries and islands on different amateur bands. The WAE is also available to SWLs. The rules apply accordingly.

2.2. The award is issued in three classes: WAE III, WAE II, and WAE I. The classes are based on the number of European countries worked and a score of country points added up from the different bands (cf. 2.3).

Applicants for the basic WAE III have to submit QSL cards proving two way contacts with at least 40 different countries of the "European Countries List". At the same time the cards must prove a minimum of 100 country points.

WAE II requires 50 countries with a total of at least 150 points. For WAE I 55 countries and 175 points are needed.

After receiving the basic award only the necessary additional confirmations are required for a higher class.

2.3. Each European country counts one country point on each of the six HF-bands (1.8 MHz, 3.5 MHz, 14 MHz, 21 MHz, 28 MHz). Only four bands per country, however, are eligible for the point score. Five points per country can be achieved by working the same station on all bands. Two additional points per country can be obtained by a contact on each of the VHF/UHF bands. Stations outside Europe may claim 2 points for each European country on 1.8 MHz and 3.5 MHz.

2.4. The WAE is issued in two divisions:

2.4.1. Exclusively telegraphy, i.e. two way CW contacts.

2.4.2. Exclusively telephony, i.e. two way AM/FM/SSB contacts.

2.5. Holders of WAE I get a special WAE badge.

## 3. EU-DX-D

3.1. The EU-DX-D is an award that may be claimed annually. First year of issue is 1964.

3.2. The EU-DX-D is issued in the following classes: Telegraphy - Telephony (AM/FM/SSB) - Mixed Modes. For the "mixed" class at least 30 per cent of the contacts must be made in a different mode.

3.3. The basic idea of the award is a proportional combination of European and non-European contacts worked in the course of one calendar year.

3.3.1. A minimum of 50 points is required for the EU-DX-D. 20 points must be obtained by contacts with European countries and 30 points by contacts with countries outside Europe. All these contacts have to be made within one calendar year.

3.3.2. All amateur bands (HF and VHF/UHF) may be used. Each different country counts one point (on 1.8 MHz and 3.5 MHz two points). A country can only be counted once regardless of the band(s) used. The countries are determined by the "European Countries List" and ARRL's "DXCC Countries List".

3.3.3. Stickers are available for each additional block of four European plus six non-European countries within the same calendar year.

3.4. The EU-DX-D may be claimed every year anew. Each year's score may be added to obtain the EU-DX-D 500 and EU-DX-D 1000. The DARC issues a seal of merit for 500 points and a trophy for 1000 points. There is no limit as to the number of years.

## Address:

DARC DX-AWARDS  
P.O. Box 262  
D-895 Kautenburen  
Germany (FRG)

# AWARDS

## COLUMN

Brian Austin, VK5CA

P.O. Box 7A, Crafter SA, 5152

A merry Christmas and a happy New Year to you all from the Manager and his staff (Marlene). May the New Year bring you lots of DX and, even more important, QSL cards.

Early in the New Year I will be publishing a full list of members of the DXCC together with their scores. However, I would like to welcome the first Novice licensee to make the grade, Len Poynter, VK3NCN. Congratulations, OM.

**DARC DX AWARDS** continued:

## 2. WAE

2.1. WAE stands for "Worked All Europe", a certificate awarded to amateur radio stations for

contacts with almost all European countries and islands on different amateur bands. The WAE is also available to SWLs. The rules apply accordingly.

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**DARC DX AWARDS** continued:

## 2. WAE

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## THE 1979 FRENCH CONTEST

CW January 27th 0000 UTC to 28th 2400 UTC.  
Codes: for all stations; RST and the No. of the QSO.

Traffic: only with francophones countries — 95 French departments (two figures).  
— DA1.2 sin/FFA (F forces in DL)  
— all DUF countries  
— 9 Belgian provinces (two letters)  
— and DA2 sin/FBA (Belgian forces in DL)  
— 23 Cantons of Switzerland (two letters)  
— all other francophones countries — LX — 40 — 00 — 38 — 9Q — 9U — HH — VE2.

Points: for each QSO in the same continent 3; with another continent 10.

Multiples: one point, per band, for each unit above.

Final scoring: the sum of all points for QSO multiplied by the sum of all points multipliers.

Logs: must be sent, with recapitulative sheet (all multipliers, list per band, for checking), to REF French Contest sq. Trudeau 2 75009 Paris.

The sole 1978 contestant from Australia was VK4AK (A1).

## THE WEST AUSTRALIAN 150TH YEAR CELEBRATION CONTEST

### CONDITIONS

The aim of the contest is for amateurs in all countries to contact amateurs in Western Australia (VK6) on all bands using all modes, this being to commemorate the 150th year celebration of the foundation of Western Australia.

### REWARDS

The three highest scores from each continent for mixed and individual modes will receive a commemoration certificate. This contest is also open to SWLs.

For VK amateurs and SWLs the three highest scores from each State will be eligible for a certificate while VK6 participants who have more than 100 out of State QSOs will get an award.

### RULES

#### 1. Duration:

The contest will commence at 1600Z on 31 December 1978 and end at 1600Z on 31 December 1979.

All authorised amateur bands may be used between 1.8 MHz and 28 MHz using any of the modes appropriate to the regulations applying to the entrant. Operators are encouraged to operate both CW and SSB.

#### 2. Scoring:

One contact in each mode is allowed in each band every day with the same station, for which the following scores and multipliers will apply: CW — 5 points per contact.

Phone — 3 points per contact.

RTTY — 6 points per contact.

Multiples: One point per band used, provided that 30 QSOs are obtained on that band, excepting for 1.8 and 3.5 MHz, where 1 QSO will count.

Final Score — Total Points x Total Multipliers.

#### 3. Logs:

Contest logs to be set out as shown below and bear a front cover sheet bearing the following:

Call: Claimed Score:

Address: Sig.:

Date Time Call Band Mode RST RST Points Out In Scored

# CONTESTS

Wally Watkins VK3ZNW/NCU

Box 1065, Orange 2800

## CONTEST CALENDAR

### December

2/3 ARRL 160 METRE CONTEST  
9/10 ARRL 10 METRE CONTEST  
16/Jan ROSS HULL VHF/UHF MEMORIAL CONTEST

### January

27/28 THE 1979 FRENCH CONTEST CW  
JOHN MOYLE MEMORIAL FIELD DAY.

## 1978 VHF MID-SUMMER FIELD DAY CONTEST

The NSW VHF and TV Group is conducting the annual Mid-Summer Field Day Contest over the weekend 9-10th December.

### Starts:

1200 Saturday 9th December (EASST)

### Finishes:

1200 Sunday 10th December.

### RULES

1. All amateur bands 52 MHz and above may be used.

2. A station may be worked once per band per clock hour.

3. Minimum scoring distance is 1 km.

4. Scoring is only permitted on a direct contact or via OSCAR. No HF, crossband or repeaters allowed for scoring.

5. Serial numbers, callsigns, band, time, mode and location of each station worked must be recorded in your station log.

#### SECTIONS

1. Field Station multi-operator.
2. Field Station single operator.
3. Mobile Station.
4. Home Station.

In the case of a single operator field station, only one person is permitted to operate the station, but unlimited moral support is allowed.

Entries may be submitted for the best six consecutive clock hours and/or the best overall score in each of the above sections.

#### SCORING

	6m	2FM	2Tone	70cm	576	1200	2400	3400	5700	10G	21GHz
1-50km	3	1	3	4	10	20	40	70	100	140	200
51-100	6	2	6	10	50	100	150	200	300	500	1000
101-150	15	5	15	30	100	200	400	800	1600	3200	6400
151-300	30	30	30	50	200	400	1600	3200	6400	16k	32k
301-500	75	45	45	100	500	1000	2000	4000	8000	16k	32k
501-800	60	75	75	200	600	1200	2400	4800	9600	20k	40k
801-1200	15	100	105	400	700	1400	2800	5600	11k	22k	44k
1200-2000	30	225	225	500	800	1600	3200	6400	12k	24k	48k
2001+	75	375	375	600	1000	2000	4000	8000	16k	32k	64k

**ENTRIES** must give the callsign, number of contacts and points claimed, for each station worked (entries should show points claimed for each band as well as the total points for each station worked). It is not necessary to submit a complete log extract. Attach a cover sheet showing your callsign, location and points claimed in each section entered.

Entries must reach the Secretary, VHF and TV Group, WIA, 14 Atchison Street, Crows Nest, NSW, 2065, by Friday, 9th February, 1979.

Cost of entry is \$2.00, postage 50 pts.

70cm modes VFO or ZL, 50 pts, other 100 pts.

**NOTE:** Laser beams, spotlights, nuclear radiation, etc. score as for 21 GHz. Carrier pigeons may be used to set up contacts but not for scoring. (Fire restrictions preclude the use of smoke signals in this contest). ■



The ceremony of the lighting of the oil lamp, by the Minister of State.



## INTERNATIONAL NEWS

Recently elected as the 102nd, 103rd and 104th members of the IARU were the amateur radio societies of Haiti, British Virgin Islands and Antigua.

It is most pleasing to observe that Amateur Radio magazine has received mentions in several recent editions of the prestigious Telecommunication Journal of the ITU under the heading "Review of Reviews" covering publications, in many languages, received by the ITU.

The following press statement, received from IARU RA Secretary, illustrates the international co-operation between amateur radio societies as a growing force. The WIA contributed \$250 to this particular project.

"A carefully prepared training project of the International Amateur Radio Union — in close co-operation with the Deutscher Amateur-Radio-Club e.V. and other national amateur radio clubs will soon come true.

On September 30th, 1978, a team of 8 trainers from the Federal Republic of West Germany will go out to Colombo, Sri Lanka, to carry out a three week's comprehensive technical training course for 38 students from Sri Lanka who have been prepared for the lectures for the past eight months and who have already successfully passed interim tests.

The subject of the training course is electronics and amateur radio and the target of the training is to sit for the postmaster general's examination immediately after the end of the training.

The Government of Sri Lanka was kind enough to make available for this course the Sri Lanka Foundation Institute in Colombo where trainers and students will be accommodated during the time of the training and where suitable modern training rooms may be used. The expenses for the air tickets for the trainers will be absorbed by the International Amateur Radio Union, Headquarters, IARU while the daily allowances will be paid by Deutscher Amateur-Radio-Club e.V. in West Germany. Contributions were also made by the IARU Region 3, and by German manufacturers of electronic equipment such as the Siemens AG.

The Federal German Government will donate the Radio Society with a complete amateur radio station complete with a modern antenna and this station will be handed over to the Sri Lanka radio amateurs by the ambassador of the Federal Republic of Germany, the Hon. Dr. Dr. Wockel, during the official opening of the training course.

Radio amateurs world-wide are observing this

pilot course with greatest interest as it is the first time in the history of international amateur radio that such a project will materialise. If successful, it will be a useful way for the training of interested young people of developing countries to gain basic knowledge in electronics and to join the about 800 000 radio amateurs all over the globe in worldwide friendship and mutual understanding.

Parallel to this model course the American Amateur Radio League ARRL has developed a low-price shortwave receiver in kitform which can be easily assembled and will which will be available for purchase in a few months time. This brand new receiver will enable technically interested future radio amateurs to take part in the world-wide radio contacts of the radio amateurs.

The latest news about the Sri Lanka project is that Japanese Amateur Radio Club JARL has presented the Radio Society of Sri Lanka with yet another shortwave transceiver for their national amateur radio station. This will mean in practice that the participants of the course will be able to communicate immediately once they have successfully passed their examination with the postmaster general of Sri Lanka."

#### TWO FURTHER PRESS RELEASES ARE REPRODUCED BELOW:

"The first pilot training course on electronics and amateur radio ever known in the history of international amateur radio was started in Colombo, Republic of Sri Lanka, on October 1st, 1978.

Sponsored by the governments of Sri Lanka and the Federal Republic of Germany, by the International amateur radio union, by Deutscher Amateur-Radio-Club of West Germany and the International Divisions of several West German firms such as Siemens the official opening ceremony for the training course was held on the evening of October 1st, 1978 in the Sri Lanka Foundation Institute which is the host of the pilot project on electronics and amateur radio.

Present at the opening ceremony were the Minister of State of the Republic of Sri Lanka, the Hon. Anandalunga de Alwis, M.P., Mr. A. R. M. Jayawardene, Postmaster General and Director General Telecommunications, Dr. G. Heisch, Charge d'affaires of the embassy of the Federal Republic of Germany, Mr. John D. Nanayakkara, and Mr. Gerd Schnabel, in charge of the team of trainers from the Federal Republic of Germany. Present was also Dr. D. J. Nanayakkara, Secretary to the Radio Society of Sri Lanka.

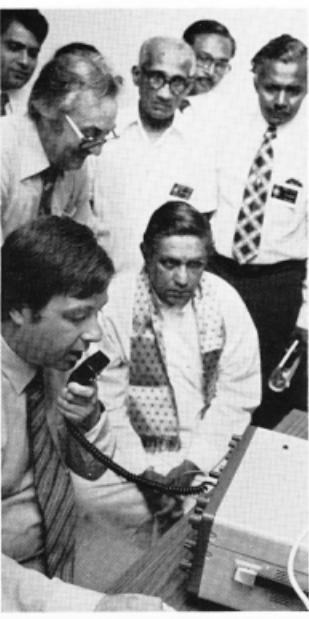
Arrival of the Minister of State to open the training course. Left to Right: John Amaralunga 4572A —President RSSL, Gerd Schnabel D. 4572A, Mr. A. R. M. Jayawardene — P.M. Gen. and Dir. Gen. Telecomm., B. D. Rempala 4572R, The Hon. A. De Alwis, Min. of State, B. Fernando 4572C, Z. Wijes Uriya 4572W.

In his address to the audience of about 400 guests, the Minister of State emphasised the importance of skilled technical training for applicants from developing countries and he continued that amateur radio — in his opinion — was a good means to train young men in the basics of electronics which would not only result in a good reserve of skilled men in the countries concerned but would also inspire further training on local level by the participants who had taken the course. The Minister of State continued that he would offer any possible help to the Radio Society of Sri Lanka and he offered a home for the club-owned shortwave station which was donated by the West German Government.

The Postmaster General and Director General Communications stressed in his speech that training courses like this on a more or less private basis were really worth to be backed up by all possible concerned countries and he continued that the Government of Sri Lanka would offer all possible assistance for amateur radio on the forthcoming WARC 1979 and would — this was a promise definitely vote for keeping or even extending international amateur radio frequencies.

The Charge d'Affaires of the Embassy of the Federal Republic of Germany underlined the importance of direct initiatives for the training of young people in developing countries. He said it was the first time that the West German Government took part financially in such an activity inspired by private organisations but as he felt this to be a good and important matter he was pleased to donate to the Radio Society of Sri Lanka a most modern shortwave radio station which had successfully passed their examination with Sri Lanka postal authorities.

Mr. Gerd Schnabel, representative of the International Radio Union and the Deutscher Amateur-Radio-Club during the pilot project in Colombo, Sri Lanka carried out in his speech that the international amateur radio union would always be



The Minister of Education of the Republic of Sri Lanka watches a QSO which Hans 457VZ (DJ0VZ) is having with an Australian AR station in WA. The Irish born operator was thrilled to be able to have a few words with a member of the Sri Lanka Government.

prepared to offer assistance to local associations whenever needed and he pointed out that a good reserve of skilled men would be made available by amateur radio on local level and that best results could be achieved with cheapest means. He continued that it was no secret that even NASA frankly admitted that qualified personnel for the NASA organisation could not be met so easily if there was not a permanent supply of highly skilled technicians who usually received their first training on electronics through the American Amateur Radio League, the American amateur radio organisation. He further said that any government was well advised if it would make use of the nearly unlimited possibilities of amateur radio which does not only create international friendship, without looking at race, colour, or political opinion, but would care for international understanding with more than 100,000,000 amateur radio stations all over the world."

"On Saturday, October 7th, 1978, the Minister of Education, Nissanka Wijeratne, visited the training course for electronics and amateur radio, held at the Sri Lanka Foundation Institute in Colombo by eight trainers of the IARU/DARC.

In the course of the visit the Minister of Education expressed his satisfaction that Sri Lanka had been chosen as the first place to carry out such training course and he assured the service that amateur radio will have his full support in all schools and universities of the country. He authorised the Radio Society of Sri Lanka to visit schools and universities to give speeches on amateur radio and the Minister added that he will sponsor local school and university clubs under the Radio Society of Sri Lanka and that he would be prepared to raise certain funds from the Ministry of Education to enable such clubs to set up their own amateur radio stations once one or more of the members have passed through the PMG's examination.

This is no doubt a considerable breakthrough for amateur radio in Sri Lanka and — after sufficient completion of the course performed by trainers of IARU/DARC at the moment sufficient trainers will be available to set up local clubs in other cities of Sri Lanka and to start a training programme immediately. This, too, will have the full support of the Minister of Education and may be carried out in school rooms in the various town and communities.

To end his visit to the training course for electronics and amateur radio, the Minister of Education paid a visit to the club station of the Radio Society of Sri Lanka, donated by the Government of the Federal Republic of Germany and presently located at the premises of the Sri Lanka Foundation Institute in Colombo. A contact with West Australia could be made at once and the Minister of Education had a few words with the operator at the other end — an Irishman who had emigrated to Australia nine years ago and he was obviously thrilled to have the rare opportunity to talk to a member of the Sri Lanka Government.

The amateur radio station of the Radio Society of Sri Lanka has made more than a thousand contacts so far. It is operated under the call sign of 457RS (Radio Society) and also by the German Instructors. They got an immediate clearance for their first license and were able to use the same suffixes as at home, 457GS (DJ7GS) 457KL (DK6KL) 457WV (DJ3WV) and so on. All instructors will regularly be on the air until October 21st, 1978, as they will return to the Federal Republic of Germany on October 22nd.

## LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

11.10.78  
The Editor,  
Dear Sir,

Firstly, let me say that I support VK2YA's letter in October AR. It seems to be an unfortunate trend these days to make various grades of amateur licence easier to obtain by a general lowering of the technical standard by one means or another. To me, this is totally unacceptable not only in concept but also in principle. The concept would appear to be that if the amateur bands can be populated, let us do so with only minor consideration to the possible end result. Some time ago employers in the technical and engineering fields would give preference to an applicant who held an AOCP, if you consider that if an applicant held an AOCP it indicated that the person had, apart from formal qualifications, a definite technical orientation with a desire to improve his/her technical knowledge which of course was of great benefit to the employer. These days, however, the story is somewhat the reverse. This is due to the rather primitive attempts at public relations advertising and the effective lowering of the technical standard of the various examinations in relation to the state of technical development within the communications industry. If you think this is just "waffle" I suggest you apply for a number of technical positions with various commercial and government bodies. Fortunately, the door is not yet fully closed and some bodies will still value the AOCP as an added skill rather than a hindrance and an indicator of possible anti-social activities.

The reasoning of the principle would appear to be that "it was good enough before, it should be good enough now". While I, in this instance, disagree with that little gem, the very act under which we are licensed dictates to a degree the technical level of the various exams. Any attempt to make these exams less demanding to suit the vast untrained reserves of future operators only depletes the standing of amateurs in the eyes of the all-important general public, who in a lot of cases already regard the amateur service as a high-powered form of citizens radio service made up of technical misfits who cause interference, and talk incessantly about the weather to faceless names around the world.

Further to this, I am in favour of "tick the box" answer for the NAOCP as hopefully a technically higher level than has been the norm lately, I am more definitely in favour of the AOCP or the AOCP or LAOCP. While essay type answers require some extra effort to mark, what better way for a technically competent person to judge whether or not the person sitting for the exam has the right ideas and application in the examined subject? Granted that there are some people who find essay type answers very difficult due to exam nerves and the like and I can feel for those people as I have the same problem. However, in our humble existence, there are people in all walks of life and vocations who just cannot make the grade required of them due to one reason or another and have to either live with the situation and accept their lot or find the required internal inertia to better themselves by application or further continued study. Of course, the above comments also apply to the proficiency test in telegraphy. Whilst CW to some may seem an outmoded form of communication, it is at least another and further qualification that an amateur can obtain for further privileges on our bands and generally requires a lot of hard work to gain a degree of proficiency in it, but isn't that the very thing that makes the goals we strive for worth something, something to be proud of?

In final comment on this subject, let me say that it would be most certainly of very great benefit to all amateurs and the service in general, if we make a concerted effort to train our prospective amateurs to a higher level, with a better understanding of communication electronics rather than to lower our standards as a form of false economy in order to bolster our numeric strength. Remember, CBers have number but amateurs have technical expertise, let us opt for quality, not quantity at a sacrifice ...

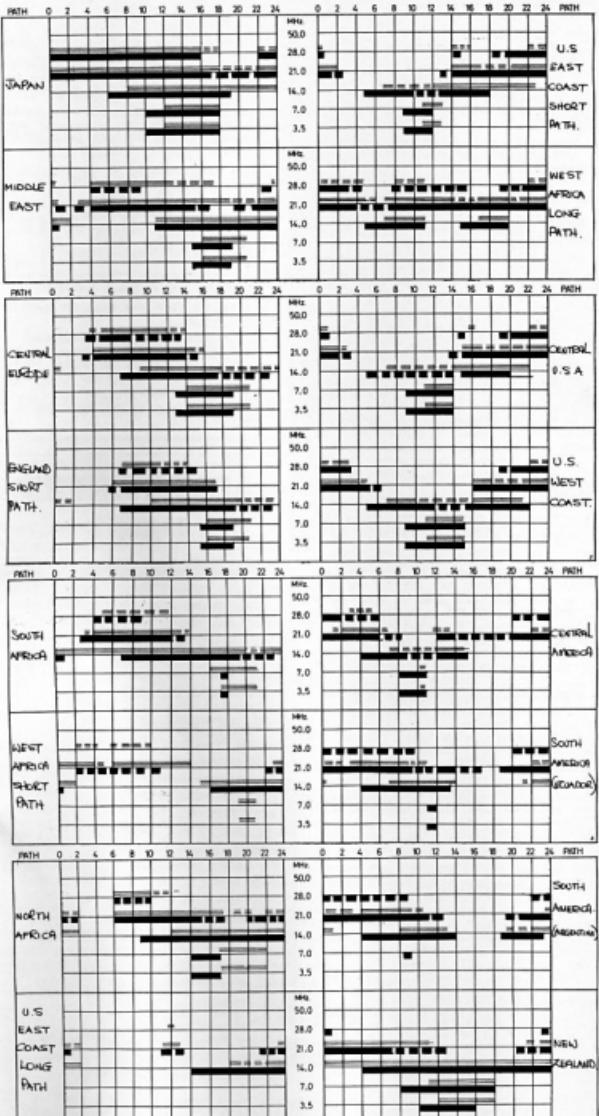
Ian Foster VK3BLF, Nicholson 3882.

## 1979 SUBSCRIPTIONS

- WIA Members are reminded that 1979 Subscription notices will be mailed out during December.
- 1979 is the year of the great WARC when amateur radio and the WIA will need every ounce of support — so please arrange early payment of 1979 subscriptions when you receive the notice.
- Members wishing to be re-graded as pensioners — write NOW for clearance — write to your Division NOW.
- New members joining in 1979 — you will receive a notice for a pro-rata amount to render you financial to 31st December 1979. Early payment of this will avoid problems with AR.
- All members are reminded that AR address labels will be automatically supplied for those still remaining unfinancial after a short period of grace.
- ADDRESS CHANGES, CALL-SIGN CHANGES, OTHER CHANGES: Write NOW to WIA, Box 150, Toorak, Vic. 3132, advising all changes—please do not wait for subscription notice to reach you.

# IONOSPHERIC PREDICTIONS

Len Poynter VK3ZGP/NAC



## ALARA

AUSTRALIAN LADIES' AMATEUR RADIO ASSOCIATION

This month our series of licensed YLs goes to South Australia, to interview Jenny Warrington VK5ZBI. Jenny is one of the six licensed YLs in the State and the first and only lady Z call.

Jenny has not been licensed for long, but she is typical of many YLs either in, or trying to get into, amateur radio.

"I suppose I first became interested in amateur radio when Mike, my OM, got his limited call in December 1974, but it wasn't until January 1976 that he suggested that I should do the AOCP course at a local technical college. The first year the teacher was David VK5HP and the second year Murray VK5ZQ. I sat the theory exam three times and finally passed in August 1977.

Mike had passed his Morse the same day I passed my theory and he got his full callsign in October; he became VK5AMU. One of the OM's remarked that it was like working a new country. Apart from that night, my only other transmitting of note was the RD contest, in which I transmitted for 15 hours.

We have a Weston 551 2m transceiver, which Mike rashly said was my Christmas present in 1976. I don't have much HF gear, but when we have borrowed some I have enjoyed coming up on the ALARA net. (What about a Christmas present for Mike? —Ed.)

I hope to sit for my CW sometime next year. Mike has a regular practice session on Thursday nights, but at present I go to cake decorating classes on Thursday, so CW will have to wait.

My other hobbies include gardening, knitting, crocheting and needle terrariums. I have three children, two at high school, and one just started primary school. I help out at both school canteens, belong to the Uniting Church fellowship group and have just resigned as president of our Mothers and Babies Health Association. So I don't get on air very often".

In closing this month's ALARA notes we wish all our readers a happy Christmas and provide our hint of the month, from a YL who wishes to remain nameless.

Do you ever wish you had an intercom system to talk with the OM in the shack? If so, you will find that a mixmaster makes an extremely good intercom, especially if he works HF. A long sustained blast will make it impossible for him to work anyone, and thus force him to come in for tea. With practice short messages can be sent by Morse code. However, with continued use, this system tends to be replaced by a conventional system, that can be more easily ignored.

73 from ALARA,  
Heather Mitchell VK3AZU, Publicity Officer.



Jenny Warrington VK5ZBI

# IARU NEWS

# HAMADS

## FOURTH REGION 3 CONFERENCE

The IARU Region 3 Association held its fourth conference in Bangkok, Thailand on 7th, 8th and 9th October. Member Societies represented by delegates were ARRL (USA — Pacific Territories) — HARTS (Hong Kong) — JARL (Japan) — MARS (Malaysia) — NZART (New Zealand) — PARA (Philippines) — RAST (Thailand) — SARTS (Singapore) and WIA (Australia).

In addition, Vice, Clark W4KFC, Vice-President of IARU was present, as Noel Eston VE3CJ, President of the IARU, was unable to make the journey to Bangkok because of ill-health. The four Directors of the Region also attended the Conference.

The Conference was formally opened by the Deputy Minister for Communications of the Royal Thai Government, Sripoom Suknent (HS1SS). The Deputy Minister assured delegates that the claims of the Amateur Service for the WARC would be carefully borne in mind by the Government of Thailand.

The Conference appointed the President of the host Society, RAST, Kamchai Chotikul HS1WR, as Honorary Chairman of the Conference and Fred Lunn HSTAD, Working Chairman. David Rankin VK1RHR, Secretary of the Region 3 Association, was appointed Conference Secretary and Noaki Akiyama JH1VRO, was appointed Assistant Secretary of the Conference.

Each Society reported on the present position of WARC preparations in its country and considerable time was devoted to WARC generally. The Conference varied a number of previous policies adopted by the Region 1 and Region 2 Conferences this year. In particular, a policy not to seek change to Article 41 of the ITU Radio Regulations, was confirmed. That Article deals with the Amateur Service. The Conference adopted a paper relating to the Amateur Satellite Service submitted by JA1NET.

The President of the IARU had previously informed IARU Member Societies that Michael Owen VK3KII, would be a member of the IARU Observer Team. The Conference recommended that additional delegations from the Region to the President of IARU for his consideration, Shigetaka Morimoto JA1NRET and David Rankin VK1RHR, who would each be available for approximately half of the ten week period of the WARC. In addition, Dick Baldwin W1RU, as Secretary of the IARU announced that Tom Clarkson ZL2AZ, had been invited to be present during the WARC as Special Adviser to the President of IARU.

A grant of additional funds to meet the cost off JA1NET and 8V1RHR, as members of the IARU team to the WARC, was announced by Shozo Hara JA1AN, President of JARL and further funds were promised by PARA and WIA. Other business of the Conference included discussion of the Region 3 amateur location system, from ASERT, the General Regulations of Region 3, better communications between the Regional 3, better communications between the Regional 3 and other Member Societies and many other matters.

Two Directors, Masami Saito JH3PJE and Tan Lian Huest 8V1OO, did not offer themselves for re-election and the four persons nominated were therefore appointed Directors of the Association, namely, Kelgo Komuro JA1KAB, Jose Tupaz Jr. DU1JY, Michael Owen VK3KII and Tom Clarkson ZL2AZ. David Rankin 8V1RHR was re-appointed Secretary of the Region 3 Association.

The next Conference of the Region 3 Association will be in Manila in 1982, though the Directors were asked to evaluate the results of the WARC and advise Member Societies of the effect of those results.

The Fourth Conference of the IARU Region 3 Association was marked by the continuation of a spirit of mutual co-operation between the Member Societies and the continued recognition of the importance of the next years for the Amateur Radio Service. ■

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Due to early closing dates for copy with this and January 1979 issue, Hamads which normally would be published in this issue, have, of necessity, been held over until our January issue.

We apologise to members for any inconvenience caused.

The January issue is expected to be published and delivered before Christmas.

Copy for the February 1979 issue is requested by 15th January 1979. The February issue will be published approximately 14 days later than usual.

### FOR SALE

Hallicrafters FPM-300 250W Input SSB/CW solid state transceiver with 240V AC, 12V DC PSU built in, deluxe mobile mount included, owner's manual, Dynamic mike supplied also, \$495. Hallicrafters HT-37 SWB Tx with antenna relay mike, CDE rotator, uses two 6146G's 100W PEP output 240-110 step-down transformer supplied, \$225. 10-80m bands, Mosley TA-33 yagi with cable, CDE rotator, as new, \$375. Collins 1-30 MHz Communications Rx, super radio, all the usual Collins features standard, \$650. John Berry, Ph. (02) 389 5979 AH — (02) 369 6455 bus.

Swan 240 with power supply and spare O/P valves, in working order, \$200. Grid Dipmeter LDM815, as new, \$70. VK3VA8, 8 Brennan St., McKinnon, 3204. Ph. (03) 578 2058.

Swan 350, with AC supply, \$350; Swan 240 DC/DC supply \$240; HT37 Hallicrafters Tx, \$190; Plessey B240 T/R, 23-30 MHz, AC, \$50; 432 Tx ATV and sub carrier generator, \$100; MR20 HI Band on 3 and 70, \$30; 100W SWR Bridge, \$15. Lot of other gear and bits and pieces and SAW. Solderless boards with all equipment and all 100 per cent and working OK. No reasonable offer refused. VK2AJY, QTH. Ph. (07) 370 8785.

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(Editor's Note: The power quoted exceeds the Australian legal limit.)

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# SILENT KEYS

It is with deep regret that we record the passing of —

## WALTER MARTIN PETERSON VK8BLW

It is with deep regret that we record the passing of Wally VK8BLW, on August 10th 1978, after a long period of disability.

Wally was licensed in 1937, and worked for a number of Perth commercial radio stations, finishing with SKY as Chief Engineer in 1955.

He was a member of the Institute of Radio Engineers.

Wally was involved in early experimentation with frequency modulation broadcasting, and was well known for his fine broads.

In 1966 he suffered a severe heart attack and stroke which left him partially paralysed, and with a speech problem.

Until his death this year, he operated on 2 metres.

From 1955 until his forced retirement he was a technical correspondence teacher, and was dedicated to the welfare of his many students to whom he gave many hours of extra tuition.

He is survived by his wife and four children. ■

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